FOOD MANUFACTURE

Incorporating Food Industries Weekly

NARD HILL LIMITED, STRATFORD HOUSE, 9 EDEN STREET, LONDON, N.W.1 AUGUST 1, 1954

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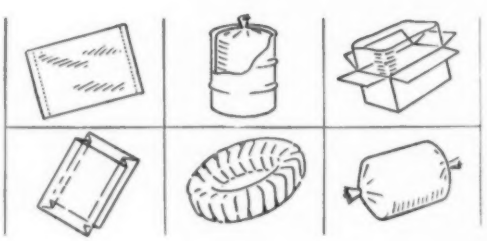

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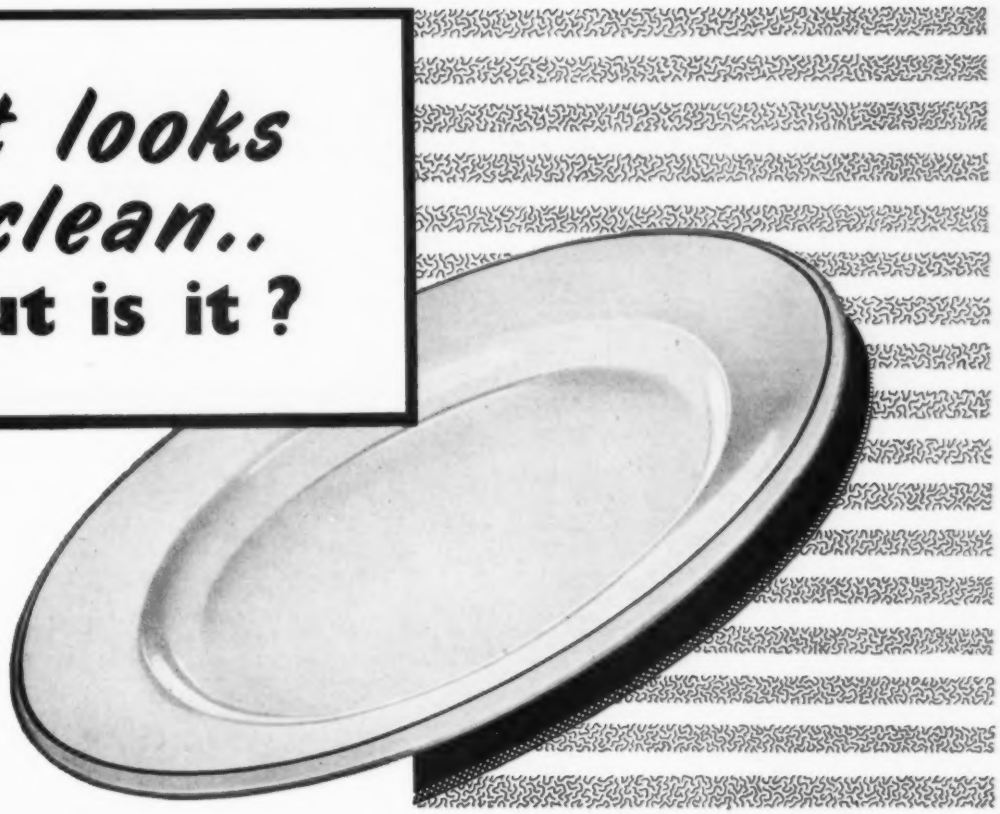

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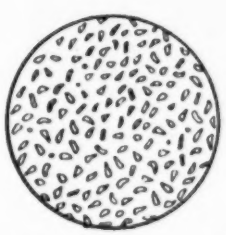
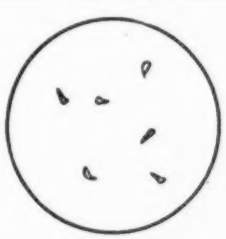


(A) *The plate count as illustrated shows a contamination exceeding 3,000,000 organisms.*



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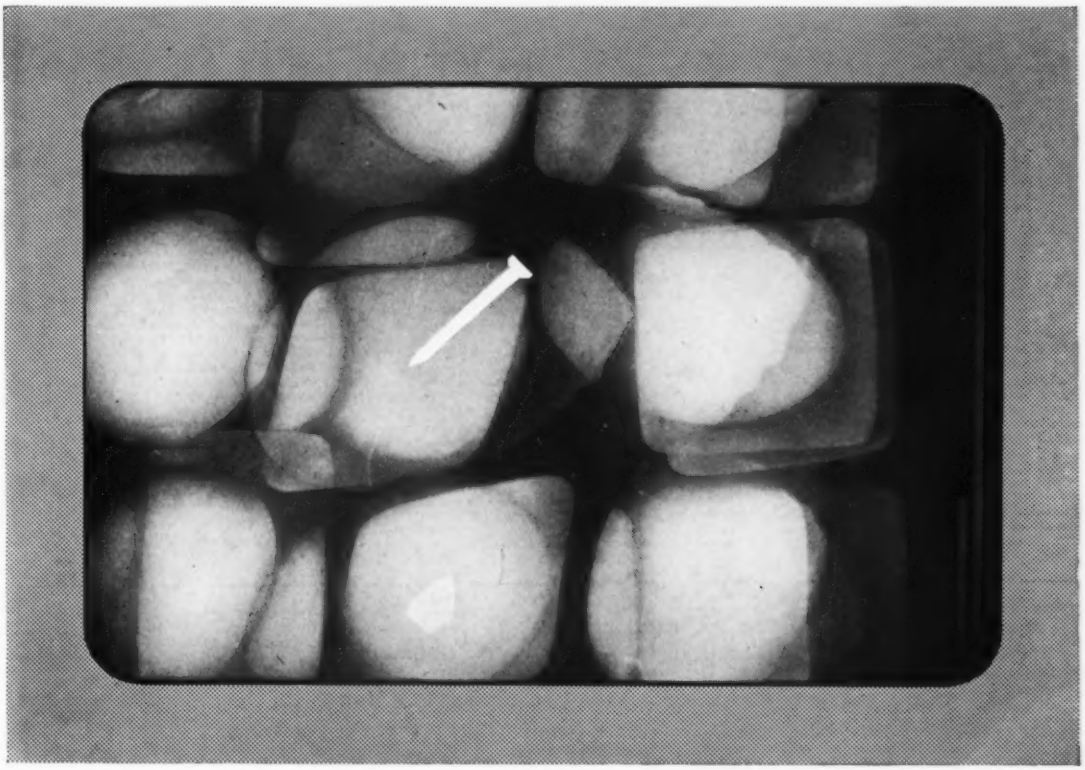

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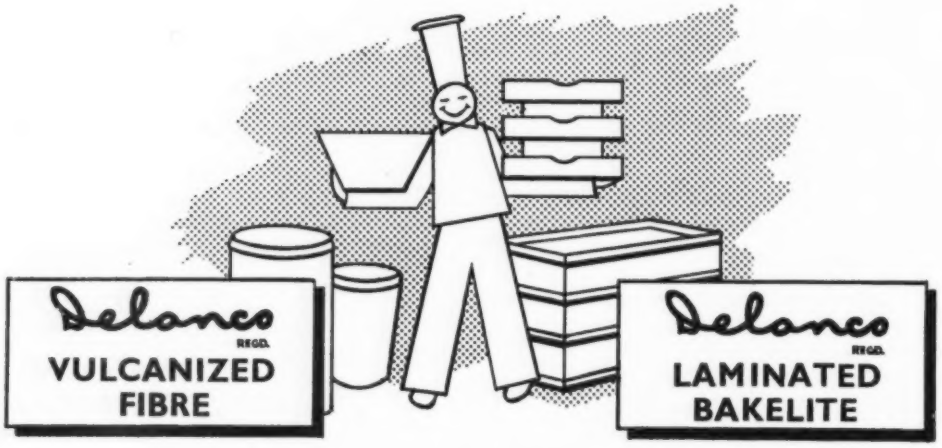

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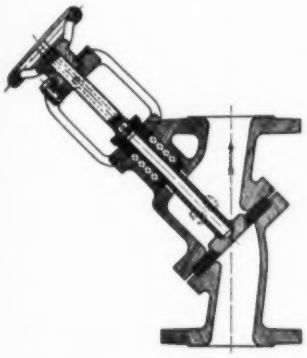

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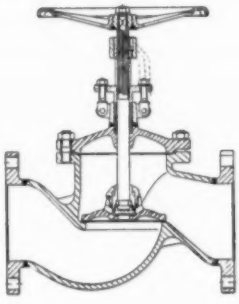

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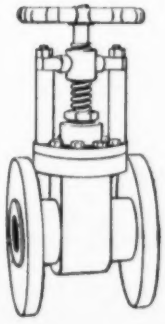

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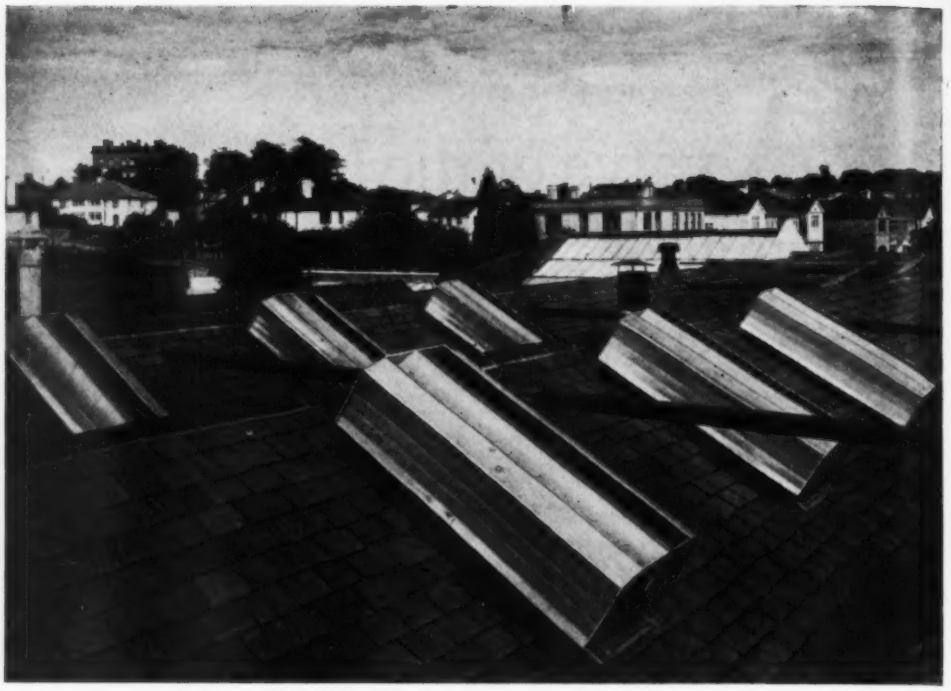

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COLTS were consulted by Farley's Infant Food Ltd. to advise with regard to the improvement in the ventilation of their Bakery and Canteen. The problem was to overcome the effects of solar radiation, radiant heat from plant and high air temperatures.

A combination of three different types of ventilators was used to result in a continuous high rate of air change without cold draughts and with local supplies of air movement for man-cooling purposes—the ideal solution to the problem.

COLTS wide experience in the ventilation of all types of buildings throughout industry is at your disposal. Why not take advantage of it?

FREE MANUAL—*with full specifications of the wide range of Colt Ventilators is available on request from Dept. S32/268.*

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THE SPECIALISTS IN PLANNED NATURAL

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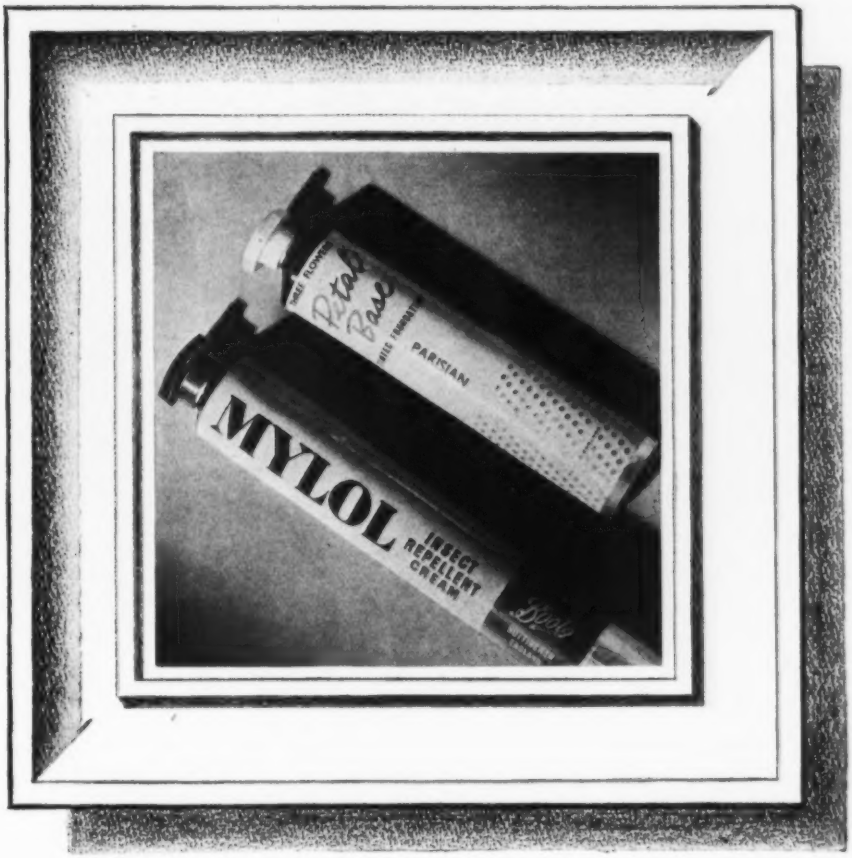
COLT VENTILATION LTD · SURBITON · SURREY · TELEPHONE: ELMbridge 8511-5
Also at Birmingham, Bradford, Bridgend (Glam.), Bristol, Dublin, Edinburgh, Liverpool, London, Manchester, Newcastle-upon-Tyne, Sheffield and Warwick. S32



Works of Art!

Betts can help in so many ways to make a neatly turned out tube into a real work of Art!

First comes technical advice on the customer's problem (full information about B.S.I. specifications on collapsible tubes always available), then a designing service, finished drawings and high quality printing. When delivery is due, BETTS can offer storage facilities of the finished product allowing part delivery of bulk orders over any period.

Other facilities include special storage for delicate and hygienic tubes and advice on the supply and installation of filling machinery, in fact a complete and competitive service backed by 150 years of experience. All types of collapsible tubes and containers made up to customer's specifications.

Write or phone for further details.

BETTS AND COMPANY LIMITED

For Rigid Containers in Aluminium
and Collapsible Tubes in Tin-coated Lead, Aluminium and other Alloys

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90%

MONOGLYCERIDE CONTENT

Advita take great pride in presenting *HYMONO*, the first molecular distilled monoglyceride to be developed and marketed in Europe.

HYMONO has a minimum monoglyceride content of 90% as compared with 32% previously available. By removal of diglycerides, the activity of the monoglycerides is increased more than proportionately to 4 or 5 times the activity of the commercial Glyceryl Monostearate previously available.

HYMONO, available in flake form, joins the already well known Admul range of emulsifiers manufactured by this Company, and has applications in Ice-Cream, Sponge Goods, Cakes, Cosmetics, Shortenings, Margarine, etc. It is dispersable in water, but the self-emulsifying property can be accentuated on request.

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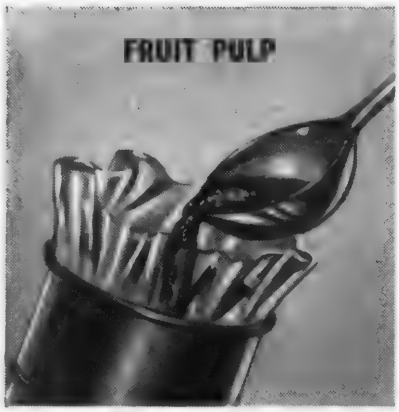
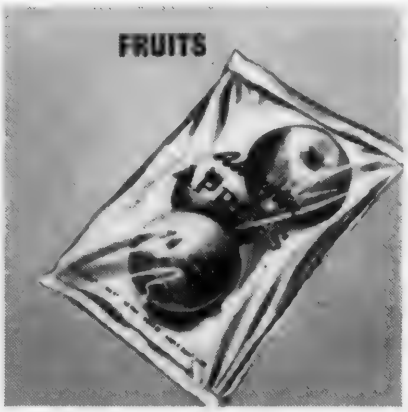
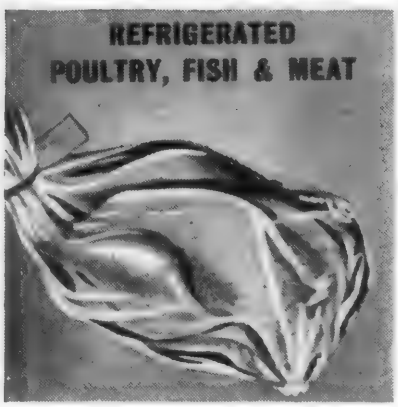
Could Diothene be used

(Polythene)

for your product?







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Diothene is a new, transparent flexible film with outstanding qualities for the packaging of food either in bulk or in packs for the counter. It is tough—does not easily tear or puncture; it is transparent—shows the contents attractively; it is sterile—has no odour, is non-toxic and cannot taste or taint the contents. Diothene is moisture-proof, liquid and sift proof, can be sealed easily and is unaffected in deep-freeze storage. Diothene can be supplied in quite small bags suitable for counter sales or in heavy gauge bags suitable for large quantities or as drum liners for bulk packaging.

Flexible Packaging Ltd at their factory at Portsmouth, manufacture the Diothene film, make up bags to exact specifications in any quantities and print in multi-colour—all under one roof. This service assures prompt deliveries and competitive prices. And because Flexible Packaging Ltd are now a subsidiary of The Metal Box Company, users of Diothene can take advantage of Metal Box design and research facilities—the most extensive in the country covering packaging requirements.

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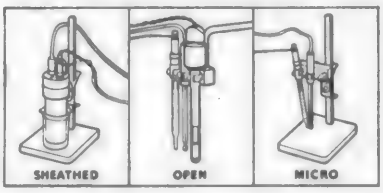
FP19/4

Ask users about the

PYE pH METER
AND MILLIVOLTMETER
DIRECT READING — MAINS OPERATED



Electrode Kit to make up all the assemblies illustrated and all necessary accessories are supplied complete with the instrument.

Many leading industrial laboratories are using the Pye Universal pH meter and millivoltmeter to their complete satisfaction. Read what The British Aluminium Company Limited says:

". . . we write to inform you that our recommendations for the purchase of a number of these equipments for use in our Routine Laboratories have been accepted. You can expect, therefore, within the next week or so to receive orders from a number of our factories. . . . We feel you would like to hear from us this tangible proof of how satisfactory we found your instruments."

Signed: Director of Research.

May we send you details of this and other instruments in our comprehensive pH range ?

STANDARD EQUIPMENT IN MANY LEADING LABORATORIES

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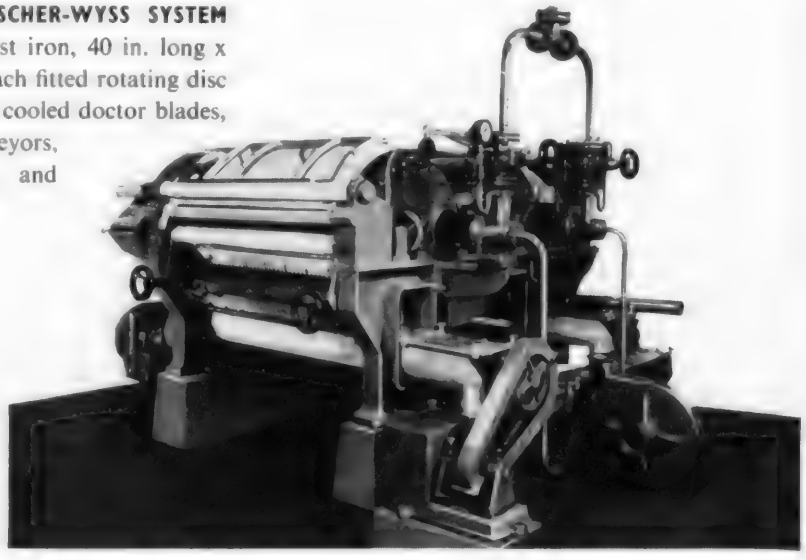
WG.50

NEW TWIN ROLL SPRAY DRIERS, ESCHER-WYSS SYSTEM

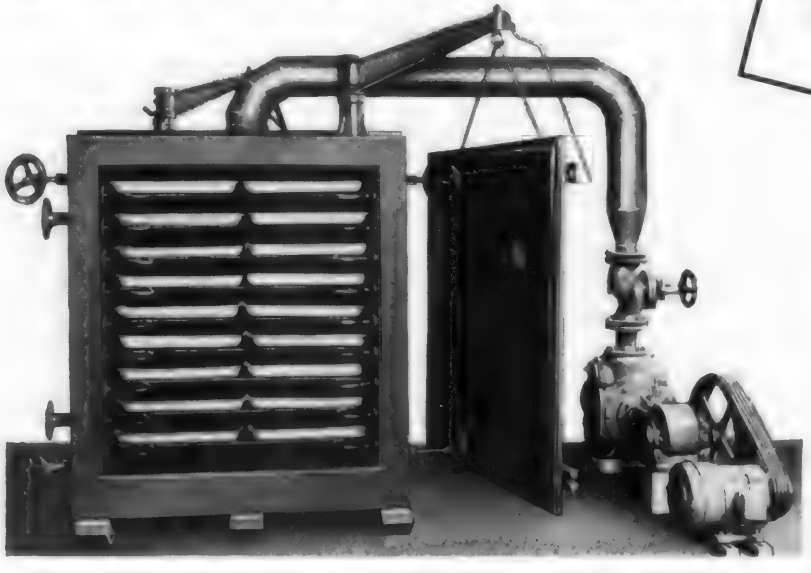
Brief Specification: Rolls of chilled cast iron, 40 in. long x 32 in. dia., for 60/80 lbs./sq. in. w.p.; each fitted rotating disc distribution trough with air jets, and air cooled doctor blades. Drier complete with enclosed worm conveyors, air blowers, feed pump and tank, and dresser for final product.



SPRAY DRIERS

DRYING PLANT

FOR IMMEDIATE DELIVERY



VACUUM DRYING OVENS

Brief Specification: Of mild steel welded construction, these Vacuum Drying Ovens are approximately 7 ft. long x 3 ft. 6 in. wide x 3 ft. 6 in. deep; fitted nine steam heated shelves to carry thirty-six acid resisting metal trays, 36 in. long x 16 in. wide x $1\frac{3}{4}$ in. deep. Davit swung door at each end, with hand wheel closing mechanism. Oven complete with motor driven horizontal wet vacuum pump, trays, pressure and vacuum gauges and connecting pipe.

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'INSULIGHT' lightens labour

"INSULIGHT" Hollow Glass Blocks transmit light to the dark heart of a building or a room, diffusing it over wide areas, in places where ordinary glazing would be undesirable. They cut the racket of the factory, the roar of traffic to a subdued murmur. In places where hygiene is essential, their smooth hard surface is easily cleaned. They hold warmth in and cold out. They keep private places private. In fact, "INSULIGHT" Hollow Glass Blocks do the work of walls—but walls of light.

'INSULIGHT' HOLLOW GLASS BLOCKS

PILKINGTON BROTHERS LIMITED

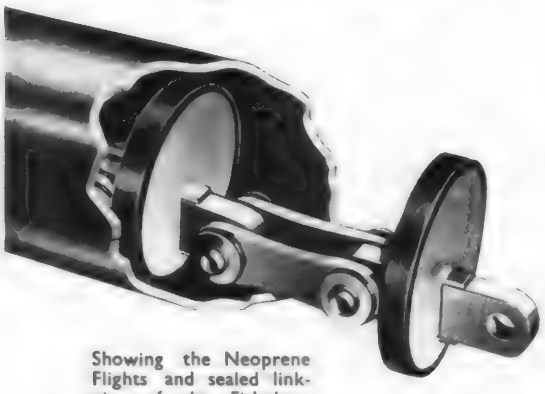
CONSULT THE TECHNICAL SALES AND SERVICE DEPT., ST. HELENS, LANCS. (TELEPHONE: ST. HELENS 4001) OR SELWYN HOUSE, CLEVELAND ROW, ST. JAMES'S, LONDON, S.W.1 (TELEPHONE: WHITEHALL 5672-6). SUPPLIES ARE AVAILABLE THROUGH THE USUAL TRADE CHANNELS. "INSULIGHT" IS A REGISTERED TRADE MARK OF PILKINGTON BROTHERS LIMITED. HGB.16

THE UNIVERSATILE LINK

This revolutionary Conveyor, which works without supervision, conveys all flowable materials through any plane or angle. Powders, semi-liquids and granular materials are handled with equal ease by this universally versatile Conveyor that operates horizontally, vertically, three-dimensionally. It can be installed to suit any layout, and under conditions where constructional difficulties preclude the use of other conveyor principles.

FISHOLOW-HAPMAN tubes cannot leak and are unaffected by outside influences. Within them runs the silent chain of Neoprene flights connected by sealed link-pins. The assembly being self-cleaning, no conveyed material is left on the tube wall.

Please write for further details



Showing the Neoprene Flights and sealed link-pins of the Fisholow-Hapman Conveyor.

FISHOLOW-HAPMAN

EN-MASSE TUBULAR CONVEYOR SYSTEM.

(Patented throughout the world)

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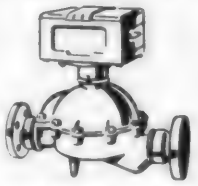
Also at London, Manchester, Liverpool, Cardiff, Glasgow, Newcastle-on-Tyne, Belfast and Dublin

Liquid process control by **MEASUREMENT**

1½" S 7. stainless steel meter with screw on flanges and 12" vertical index.

When you require to measure bulk or batch quantities of edible liquids, oils, spirits and solvents, hot or cold water, we can supply meters with summating, resettable, electrical presettable, direct reading or pointer type index attachments (as illustrated) and control equipment.

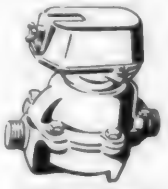


BOX TYPE COUNTER

Re-settable batch-dispensing counter with 7-digit cumulative total register.

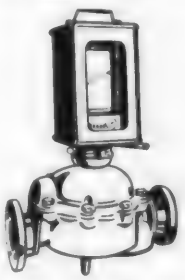
VERTICAL RE-SETTING INDEX

Can also be used to pre-set a determined quantity, with electric trip to operate solenoids, pumps, warnings, etc.



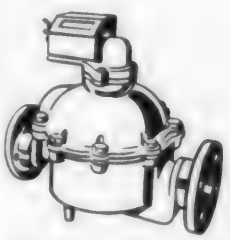
ZEROSET INDEX

Simple turning motion re-sets indicator to zero.



MECHANICAL RECORDER

Gives a graphic record on 5" x 12" chart; suitable for 4 hour, 8 hour, 1 day, 7 day periods



PREDEX CONTROLLER

Automatic means for continuous dispensing of fixed quantities of liquids.

MEASUREMENT

INDUSTRIAL **LIQUID** *METERS*

(A COMPANY OF THE PARKINSON & COWAN GROUP)

MEASUREMENT LTD. HYDRAULICS DIVISION
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Efficient
BULK
HANDLING

1,500-gallon single compartment stainless steel insulated tank for milk.

Safe, economical transport of liquids and powders for the Food Industry

Butterfields supply many of these Robust Tanks to the Food Industries for the bulk transport of important loads such as milk, glucose, edible oils, etc. The necessary insulation is provided as required and tanks can be fabricated in stainless steel, mild steel or aluminium. Butterfield 'girder' mounting gives exceptional steadiness. The tank is welded to the frame and the frame is bolted to the chassis. The need for usual metal straps is thereby eliminated.

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Butterfield
ROAD TANKS

1,400-gallon single compartment Mild Steel (lithcote lined) milk tank on Seddon chassis.

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NOODLE SOUP
CHICKEN FAT CAPSULES
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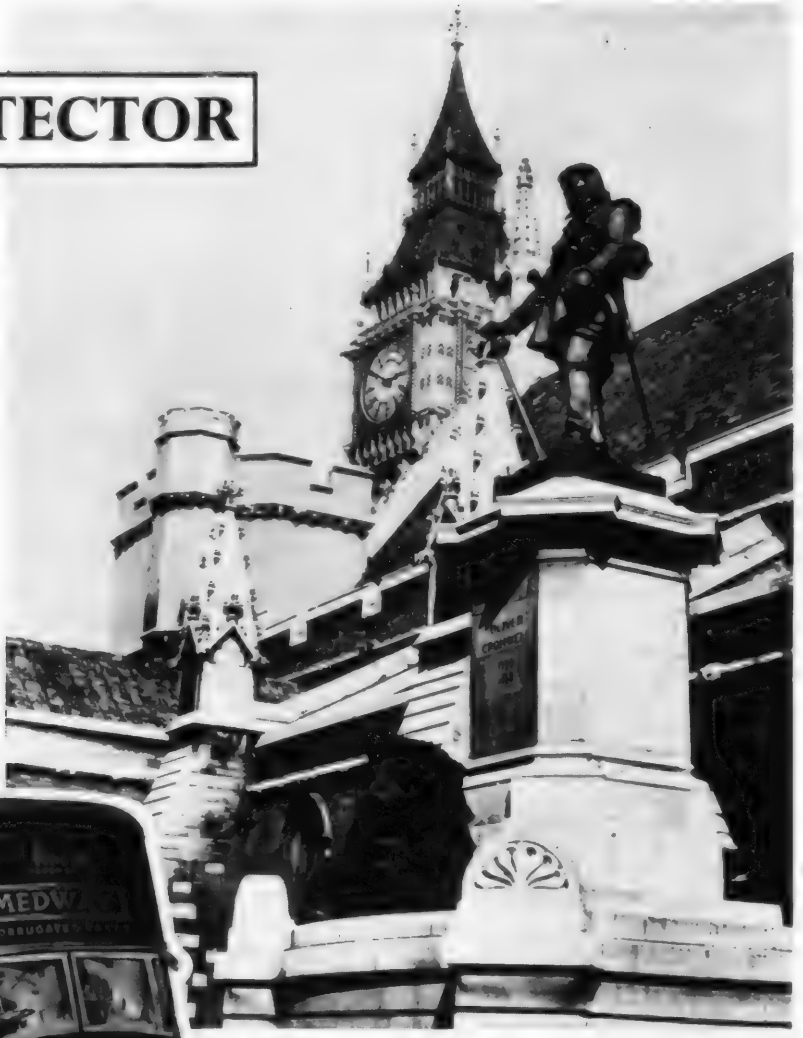
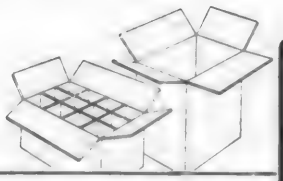
THE PROTECTOR

The statue of Oliver Cromwell before Westminster Hall. Cromwell was declared Lord Protector in 1653.



The blue vans that can be seen on their daily runs in London and the provinces are a reminder of the modern protector—the Medway Corrugated Case—used in most industries for the safe packaging of goods in transit.



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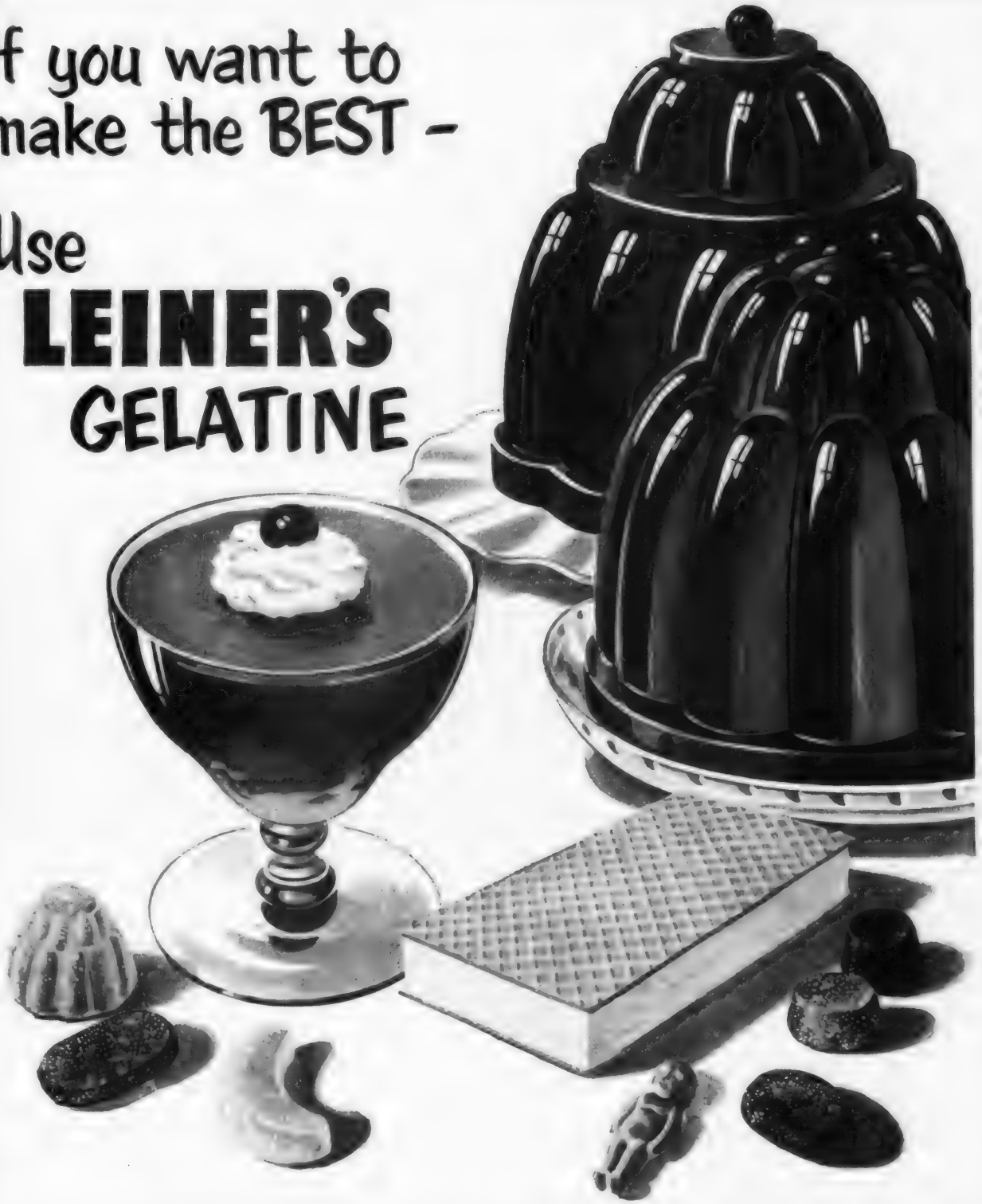

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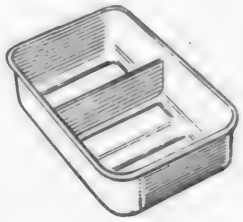
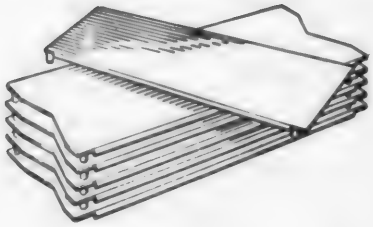
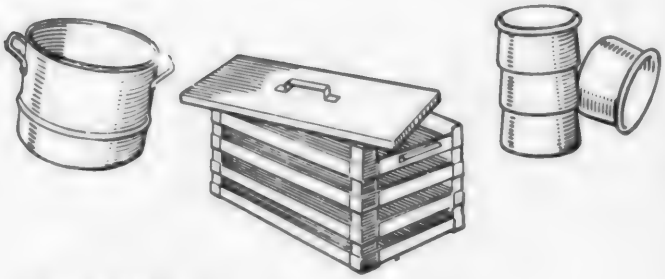
a little



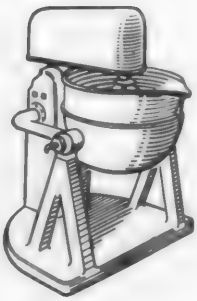


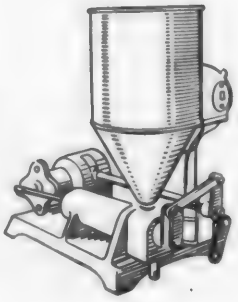
LISSAPOL

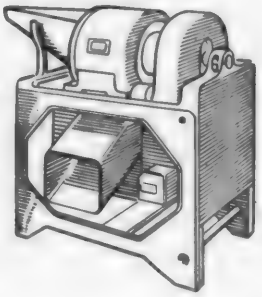
(liquid cleanser)

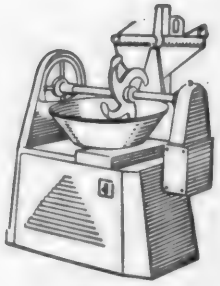


goes a long way . . .



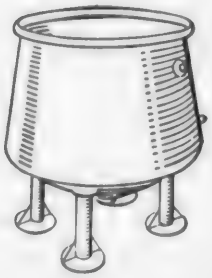






Lissapol is powerful, safe and economical for the cleaning of a wide variety of food-processing equipment.

Excellent for space cleaning, too.



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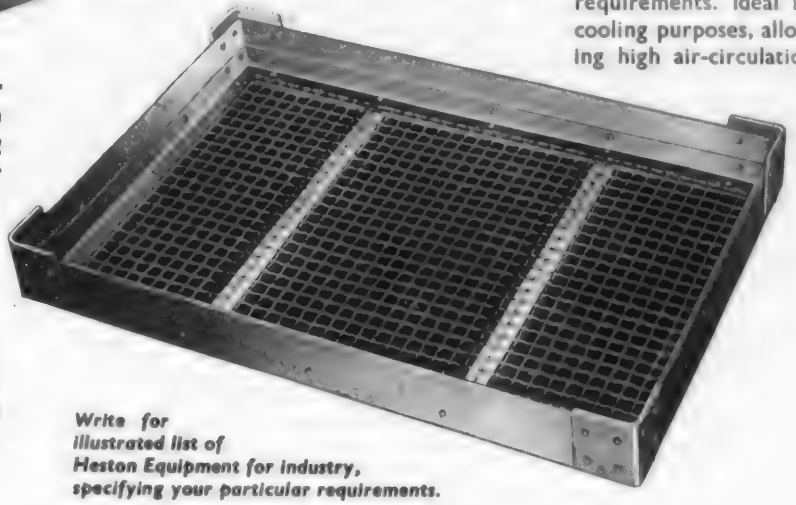
PHŒNIX *MESH-BASE* ALUMINIUM TRAYS

M.B.1.

Interstacking Aluminium tray with fine double mesh base acting as sieve for surplus sugar or lollie trimmings. Can be made in sizes to special requirements. Ideal for cooling purposes, allowing high air-circulation.

★ **Precision designed and manufactured in high grade aluminium with reinforced interstacking corner pieces. For sieve or cooling purposes.**



M.B.2.

Square mesh Tray for sieve or cooling purposes. Strongly made in stout aluminium with reinforced corner angles designed for interstacking.

Write for illustrated list of Heston Equipment for industry, specifying your particular requirements.

Special quotation for steel, stainless steel or galvanized equipment.

PHŒNIX *is the answer*

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SUNSHINE GELATINE

No ice cream manufacturer should lose the opportunity of trying Leiner's SUNSHINE GELATINE—the newest ice cream stabiliser available. Sunshine Gelatine shows many advantages over other stabilisers and is **so economical** that only ¾ of the amount of the customary gelatine is required to produce a perfect ice cream.

Every batch subjected to rigid chemical and bacteriological control to ensure **ABSOLUTE PURITY.**

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Manufacturers of Gelatine for over a Century

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Automatic AIR VENTING of process steam plant for increased output

AIR in the steam spaces of process heating units prevents the plant from giving its best output. Why is that? Is it a general condition? Is it serious? What can be done about it?

A few questions and answers:

Q: *Where does the air come from?*
A: When steam is off, air enters through valves, traps, joints, and fills the pipes and the steam spaces of the plant.

Q: *What harm can the air do?*
A: It does a surprising amount of harm. When steam enters the units it condenses, but the air cannot condense. And if it cannot get out, the air does two things; it hangs about as a stagnant film on the inside surfaces, and it mixes with the steam.

Q: *What then?*
A: The film of air puts up a tremendous resistance to the flow of heat from the steam to the process. That reduced heat transfer slows down the job, often seriously. The air that mixes with the steam reduces the effective temperature of the steam.

Q: *Can't the air get out through the steam traps?*
A: Sometimes yes, sometimes no. Some steam traps can cope with air, some cannot. But even using traps that can release air, on many jobs a lot of the air cannot get to the traps anyway. Something else has to be done.

Q: *What else?*
A: You can use hand cocks, but they are hardly ever satisfactory: either a lot of steam is blown to waste or a lot of the air never gets out. The only satisfactory way is to use automatic air vents.

> "Of all the problems that confront the steam user, the removal of air from inside heating surfaces is the most neglected, yet it is one of the most important. . . . Air is the arch enemy in steam and must be removed as rapidly and completely as possible."
> – *Oliver Lyle in "The Efficient Use of Steam."*

Q: *What are the advantages of automatic air venting?*
A: The vents automatically open to air but close to steam. On starting up the job, air is released full bore through the vents, giving quicker starting (warming-up times have been halved); the vents open to discharge any air that collects during running. They accelerate heat transfer and improve processing temperatures. They make possible a much better output performance (10 per cent., 15 per cent., even more, according to the particular condition).

Q: *Where can I find out more about automatic air venting?*
A: Send the request slip for the Information Sheet "Air in Steam Spaces" and the Pamphlet describing Spirax Automatic Air Vents.

Spirax-Sarco Ltd CHELTENHAM *Phone: Cheltenham 5175-76 Grams: Spirax, Cheltenham*
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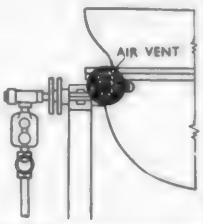
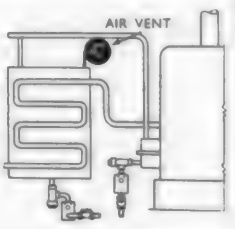
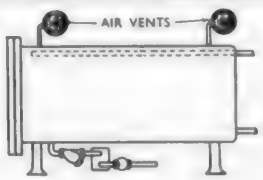
One of the series of Spirax Thermostatic (Automatic) Air Vents.

Spirax Automatic Air Vents for steam-jacketed boiling pans.



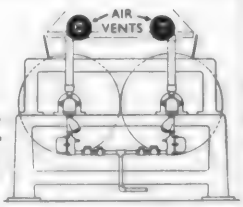
Spirax Automatic Air Vents for stills of various types.



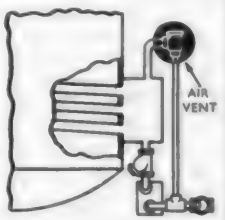


Spirax Automatic Air Vents for retorts and digesters.

Spirax Automatic Air Vents for cylinder drying machines.



Spirax Automatic Air Vents for evaporators of various types.



FOR INFORMATION PLEASE USE THIS REQUEST SLIP

Please send Information Sheet "Air in Steam Spaces" and Pamphlet No. 108 on Spirax Automatic Air Vents.

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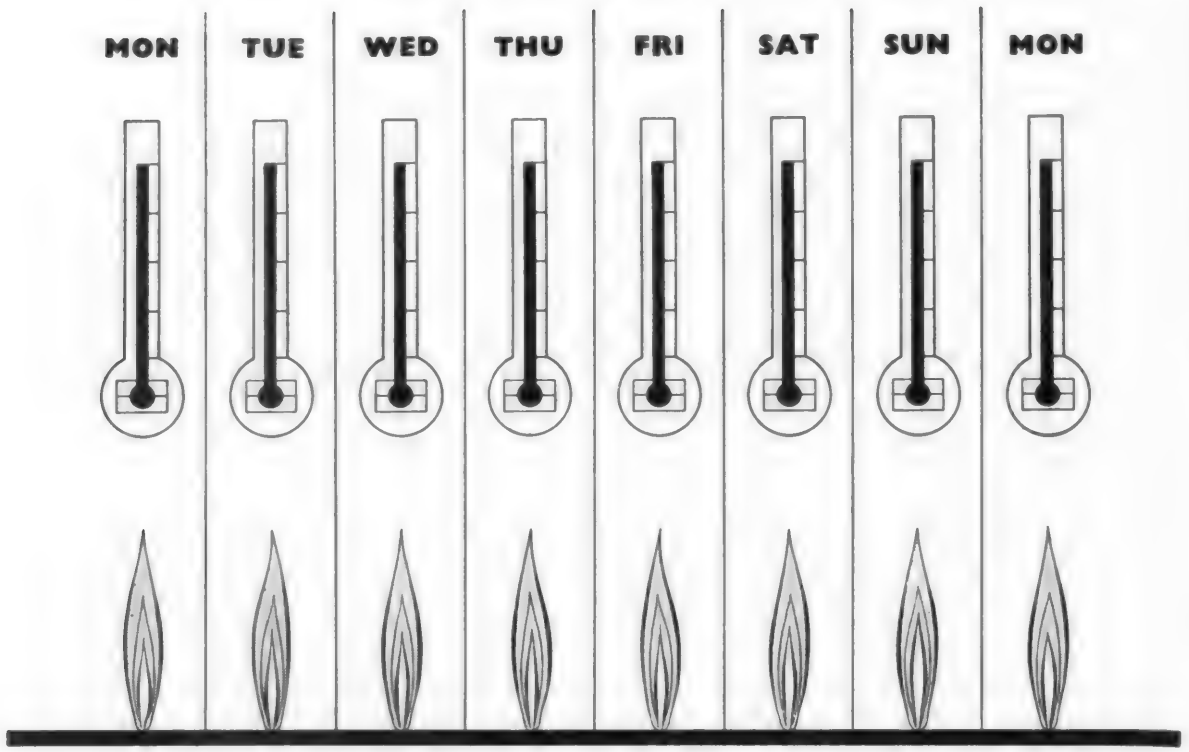
SPIRAX STEAM TRAPPING AND AIR VENTING



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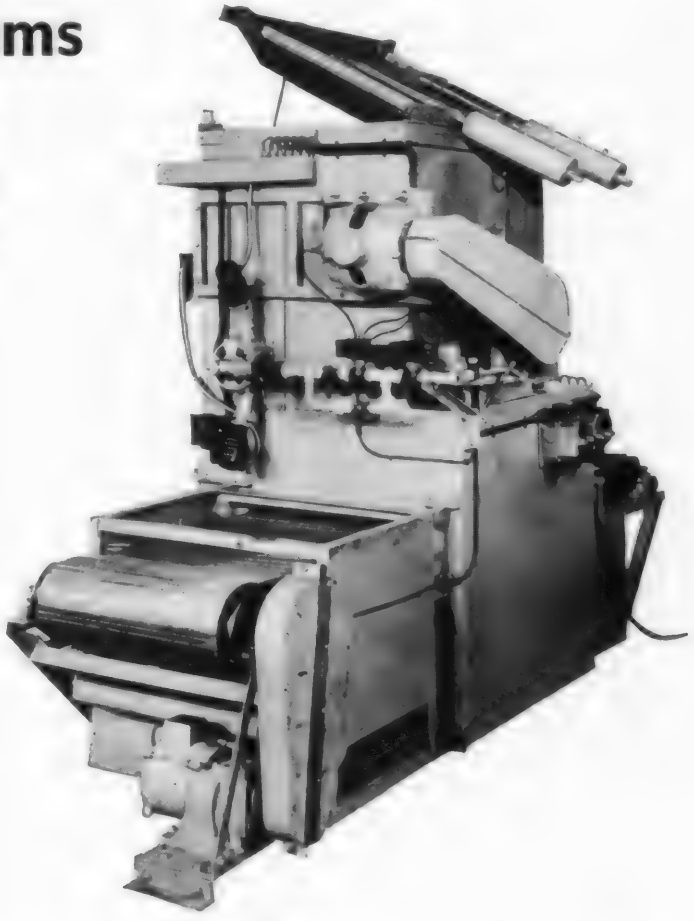
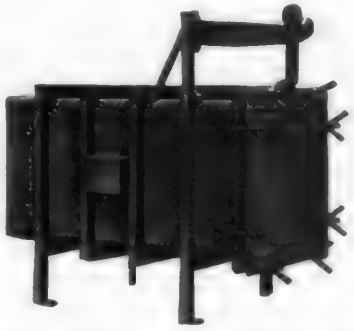
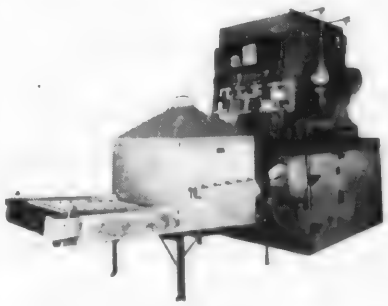


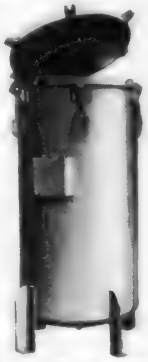
Small type HURRICANE OVEN as supplied to Messrs. DEWY and ALMY LTD.



Horizontal Retort 6' 0" x 3' 0" x 3' 0" with door closed



Major type HURRICANE OVEN as supplied to Messrs. DEWY and ALMY LTD.



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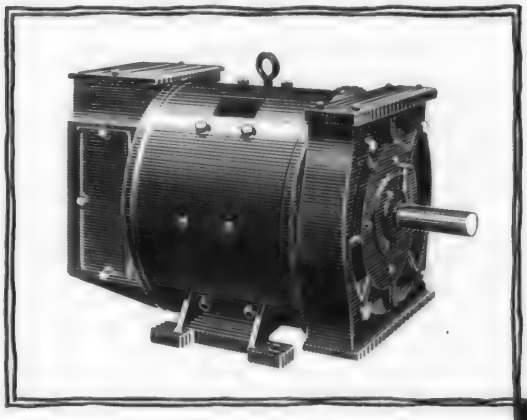
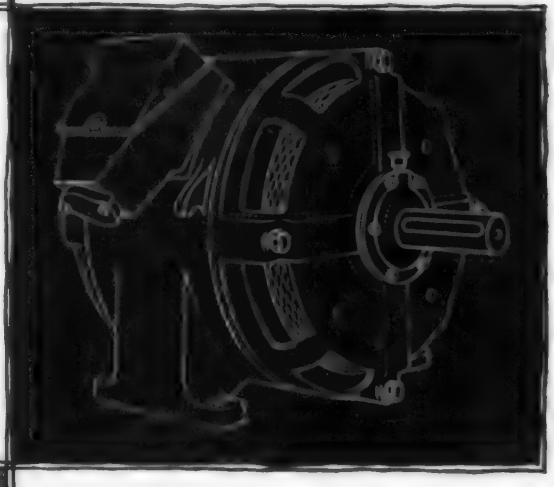
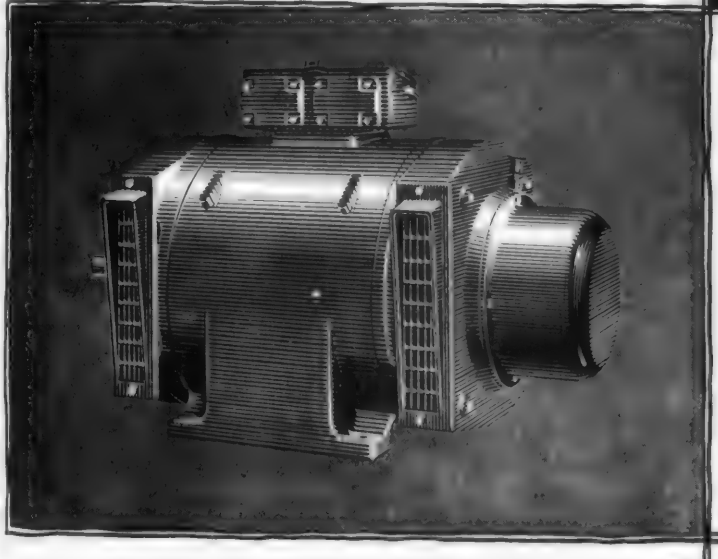


They bear

the name **G.E.C.**





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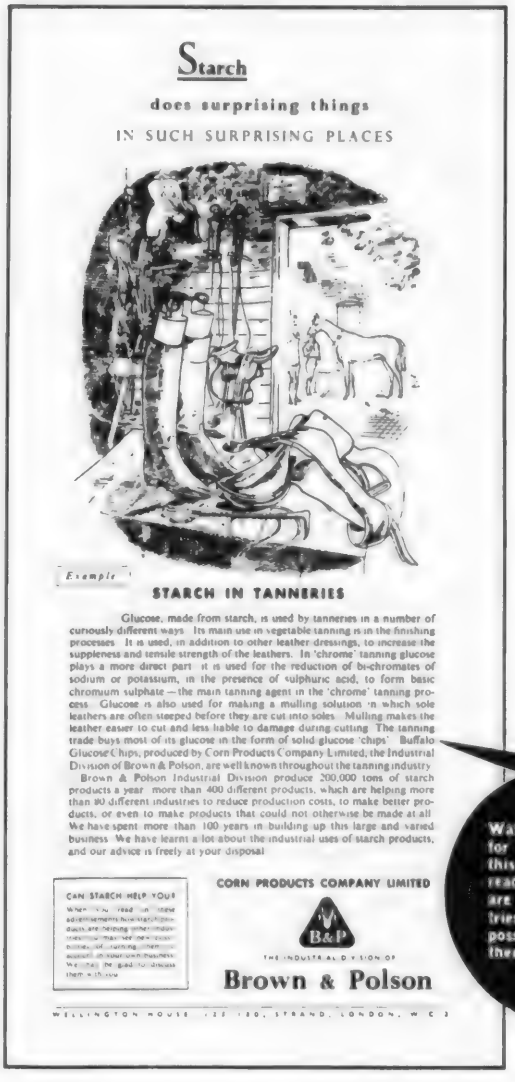
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IN SUCH SURPRISING PLACES
Example
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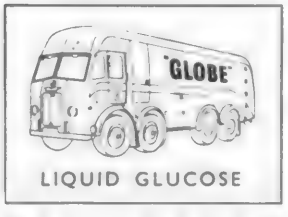

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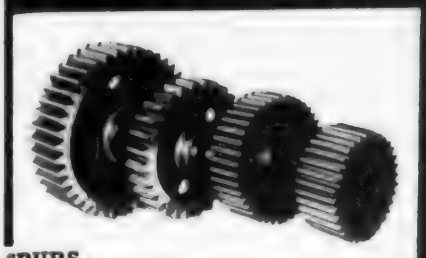

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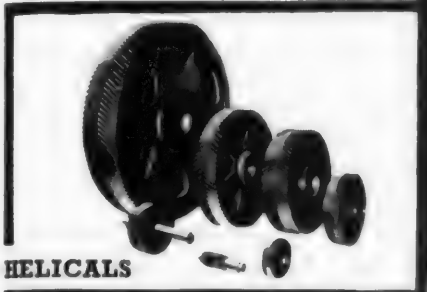

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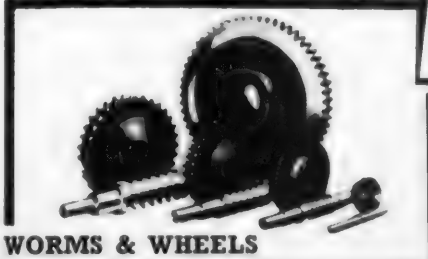

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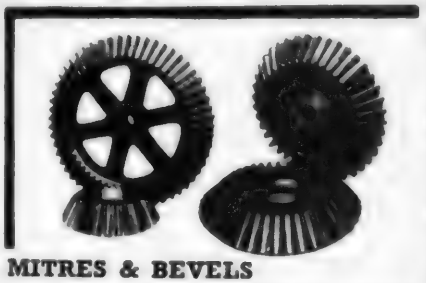

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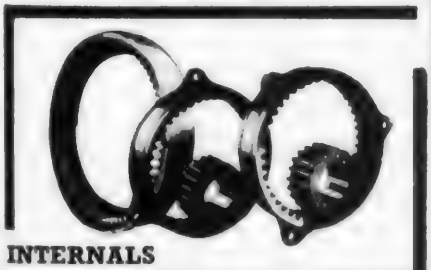

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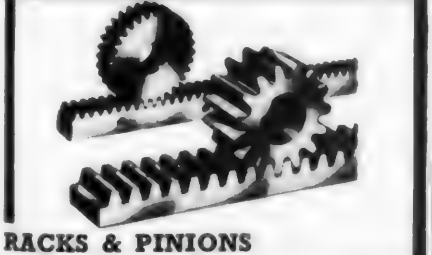

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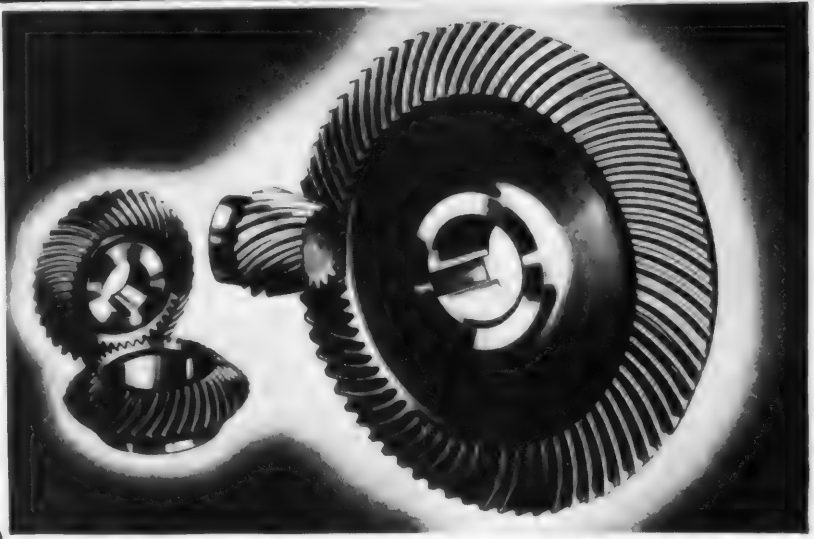

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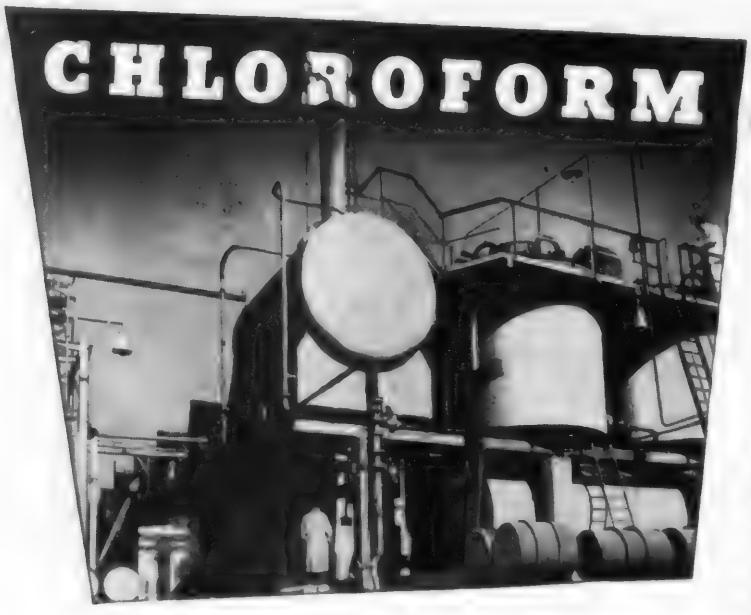

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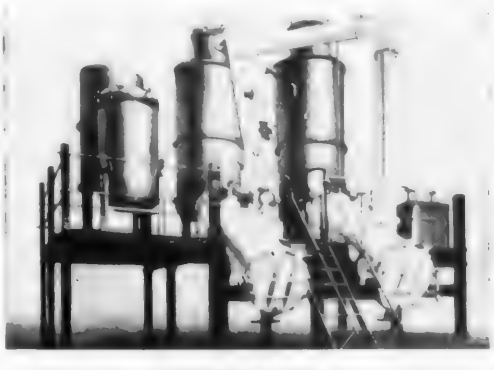

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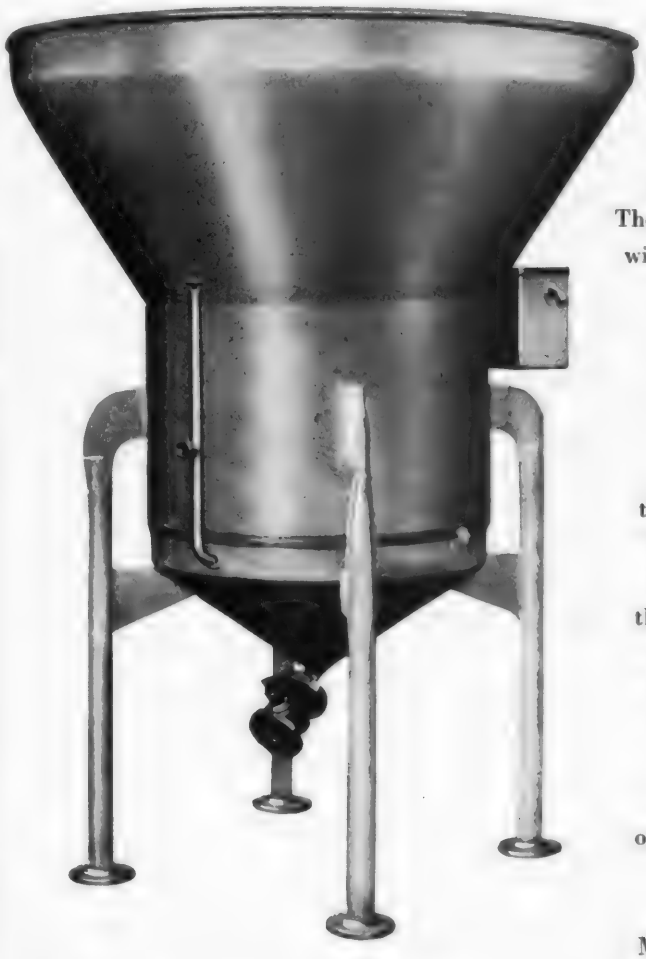

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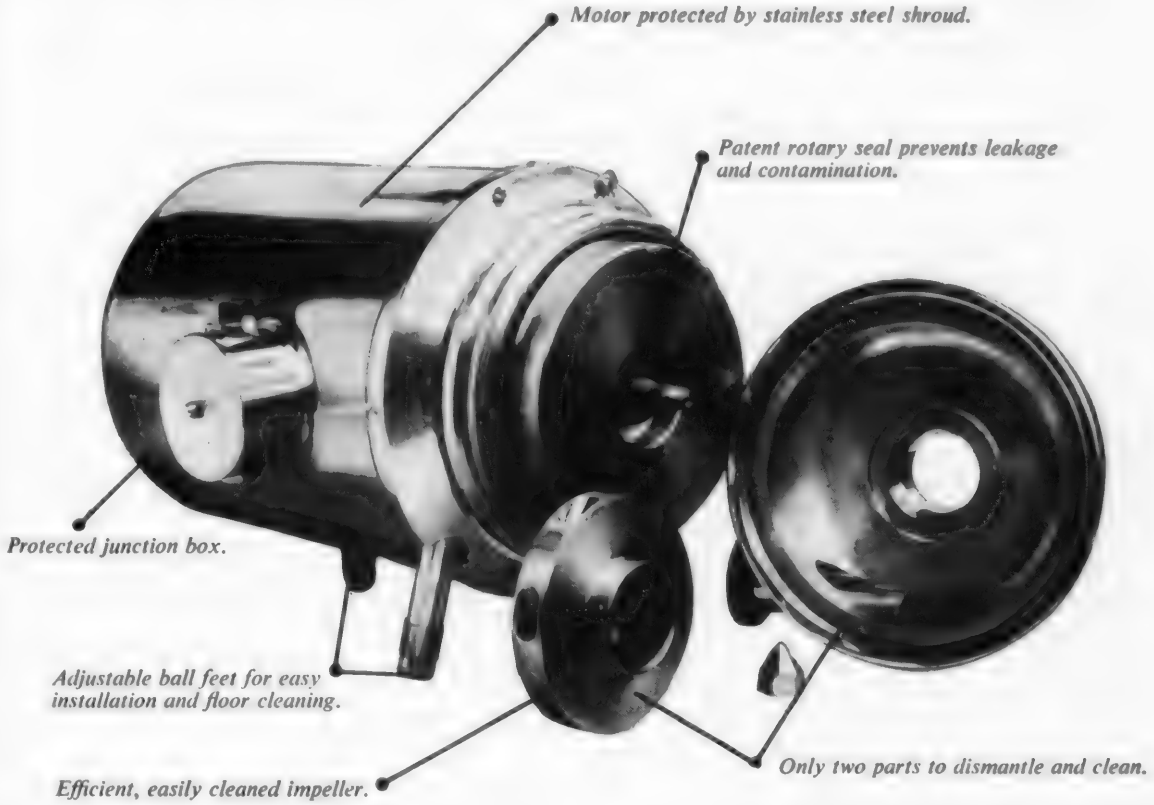
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AT the Craigmillar Creameries of Thos. Wall & Sons Ltd., cork provides the efficient insulation vital to the operation of an ice cream factory. This is just one of the many jobs which has proved the supremacy of Newalls Nonpareil cork insulation in refrigated spaces everywhere as well as in important ships of the merchant fleets. But Newalls answer to refrigeration problems does not end in the supply of insultion materials. Through depots in important centres in the British Isles, Newalls offer the experience of expert craftsmen in the application of low temperature insulation. The Craigmillar Creameries is just one example of how handsome their finished work can look. Our Cold Insulation Catalogue (sent to you on application) will give you further facts and figures about Newalls Nonpareil Cork Insulation.

Where there's a COLD INSULATION problem

there's a job for **Newalls**

NEWALLS INSULATION CO. LTD. *Head Office:* WASHINGTON, CO. DURHAM

A member of the TURNER & NEWALL ORGANISATION *Offices and Depots at* LONDON, GLASGOW, MANCHESTER

NEWCASTLE UPON TYNE, BIRMINGHAM, BELFAST, BRISTOL & CARDIFF. *Agents and Vendors in most markets abroad.*

We're settling your differences

In common with the other leading British electrical manufacturers, Crompton Parkinson are now standardising motor dimensions in order to put a stop to those dimensional differences that have proved troublesome in the past. The first motors to conform with the agreed standards—the "KLOSD" squirrel cage type—are now available up to 25 h.p. and conform to B.S. 168 for electrical performance and B.S.2083 for dimensions.

With Crompton Parkinson you still have certain differences of a welcome nature—the differences that arise from an organisation that insists upon materials, brains and workmanship of the highest degree obtainable. Users of "KLOSD" motors will find these qualities exemplified in continuous and long-lived efficiency.

When it comes to A.C. MOTORS . . .

you've got to hand it to Crompton Parkinson LIMITED

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Clean right through with

The maintenance of cleanliness throughout any organisation, big or small, is no light responsibility. Today, many undertakings are switching to TEEPOL, Shell's master detergent, for all cleaning—from board-room to basement, from canteen to cloakroom. Wherever it is used—especially wherever food and drink are prepared, processed, stored or served—TEEPOL proves that all cleaning can be faster, easier, more thorough and more economical. *Please write for a free illustrated booklet which describes the many uses of TEEPOL.*

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in liquid and in powder form

Firmajel pectin is ideal for high-quality jams and jellies and for confectionery processes. It is used in many industries for stabilising, emulsifying, binding, coating and other purposes.

Bulmer's—the world's largest producers of apple pectin—offer the advice of their Technical Service. Samples and quotations are free on request.

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Free from preservative in cans
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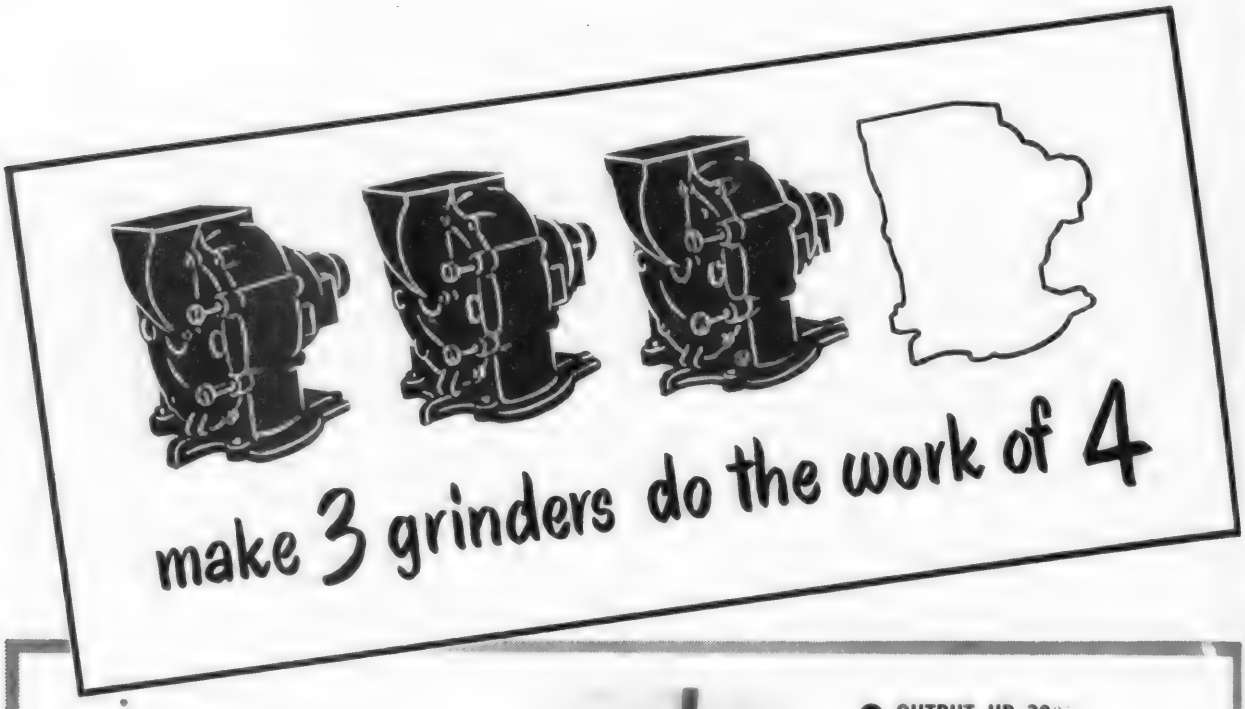

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SIMON VELOFEEDER

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- **OUTPUT UP 30%**
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TWENTY-FIVE YEARS ago, William Evans & Co. pioneered the manufacture of Pectin in Great Britain. Their unique experience is freely available to jam makers through the Technical Advisory Service. Sample quantities for production testing will be sent on request.

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Label Printers

BOWATERS

The future in brands

THE RETURN OF BRANDED FATS marks more than just another stage in the changeover from a rationed to an unrationed economy. The number and variety of the products and, particularly, the intensity and volume of the marketing campaigns that launched them were a sharp reminder to the food industry as a whole. Hard, competitive selling is back. Freedom of choice has been restored to the housewife.

The symbol of that freedom—and all that it implies—is the branded pack.

For it is by its pack that the housewife identifies the product she wants. The familiar feature of the established brand and the bold challenge of the new and untried product both beckon from the grocer's shelves. Which will she buy? *And when she has bought, which will she buy again?*

This is the crux of the matter. And it spotlights a packaging function no whit less important than brand identification . . . brand protection. For the pack has to guarantee the quality of the product. By its special properties it must ensure that the product is in perfect condition; that its flavour, freshness and all the other qualities that the manufacturer has been at pains to perfect reach the housewife as they left his factory, unvarying and unimpaired.

This is what Bowaters mean by brand protection. This is the contribution that well-planned, well-designed packaging can make to meet today's need for intensive, competitive selling. And it is this that can make today's new and untried product the established favourite of tomorrow.

For information and advice on any aspect of packaging mentioned in these pages, please write to:

DIVISIONAL SALES MANAGER, PACKAGING DIVISION,

BOWATER HOUSE, STRATTON STREET, LONDON, W.1. GRO. 4161

FLEXIBL

HOW MUCH PROTECTION does the product want? How much can its manufacturer afford to have? Protection *versus* cost—an old but thorny packaging problem thrown into relief against a background of competitive marketing conditions and the emergence of new patterns of living.

Freedom from control has brought old brands back and new brands have come along to challenge their ascendancy. It has also brought entirely new groups of products to compete for the housewife's favour. Chief among these are the processed, ready-prepared foods—cake and pudding mixes, soluble coffees and soups—that dominate the super markets in America and which are now making headway in this country.

These are complex products and they present the manufacturers with new and difficult packaging problems. How to keep goods with varying characteristics in perfect condition during prolonged shelf-life: how to keep moisture, grease and odours in—or

CLEAN TRAVEL
. . . . . by Drum
Bowaters fibre drums are used extensively in the food industry to ensure safe hygienic packaging for the more expensive base products and essential raw materials. The use of polythene liners has widened the range of drum-packed goods to include even the most "difficult" of modern food products. Would you like to know more about them?
. . . . . by Sack
Sugar, salt and powdered milk are among the many powdered, granular and crystalline food products that travel safe and clean—and economically—in non-returnable multiwall sacks. You can have a sack made with just the right number and type of plies (or walls) to give the protection required by your product. The full resources of the Bowater Organisation—design, research and production—are at your disposal to help you send your goods by sack.

PACKAGING BULLETIN

PROTECTION

how to resolve the protection *versus* argument.

There is no single answer to these problems. Packaging must be flexible enough, adaptable enough to meet the widely varied needs of differing products: to provide them with the right degree of protection at the right cost.

Waxed liners control passage of moisture vapour

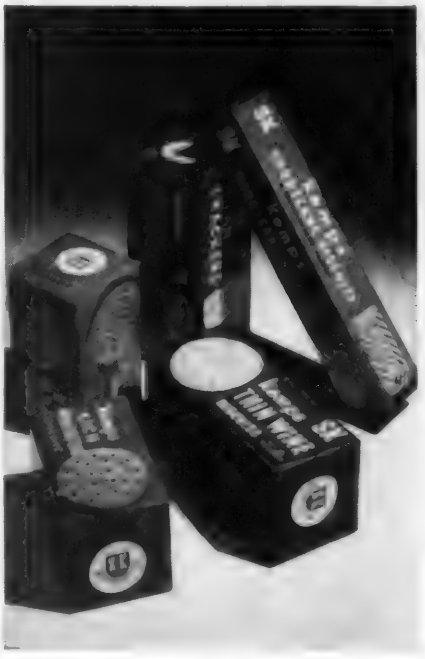
Bowaters range of protective papers and bags meet this need for varied, yet economical protection. Their *waxed papers* control the passage of moisture vapour and check contamination. They can be supplied as sheets of any size or in rolls to suit manufacturers' requirements. They can be used as carton liners or over wraps. Bowaters "Special Opaque" heat sealing waxed paper can be supplied printed in as many as four colours to make gleaming, colourful displays for the point of sale.

Bowaters can also offer protection in bag form. Their *waxed bags* are ready for immediate use, can be made heat sealing, can be supplied plain or printed. They provide a barrier against moisture and contamination, keeping powdered products dry and free-flowing, moist products at the right degree of moisture.

Then there are Bowaters *glassine and film bags*, each providing different protective properties to answer different needs. Glassine, the most transparent of all papers; a dense, compact paper offering excellent resistance to grease penetration. Clear, transparent film—moisture-proof if need be—enhancing the appearance of the product it contains.

Laminated bags give the greater protection required by products with high grease content

And for the complex product making new and heavy demands for extra protection, Bowaters have developed *laminated bags*. Twin sheets of glassine bonded together with a tough, micro-crystalline wax give these bags an exceptional performance. They will keep moisture in or out, they are grease proof, they are chemically inert and hygienic. They offer something new in package protection—and the price is right. Thus, by the development of this range of flexible packaging, Bowaters are keeping pace with developments in the food and its allied industries. More complex products bring more efficient packages for their protection. To make the best use of the choice of materials available, it is necessary for manufacturers and packaging suppliers to consult together. Bowaters packaging experts are ready to offer their help and advice.



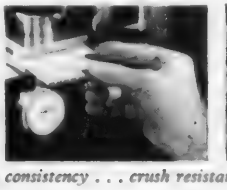
Multi-colour printing on Bowaters "Special Opaque" waxed paper gives the Scribbans Kemp range of biscuits enhanced point-of-sale appeal.

Strength in Case

Quality control at every stage of manufacture is the secret of the strength of Bowaters corrugated fibreboard containers. This control begins at Bowaters paper mills where the kraft liner and strawpaper are made. Rigid specifications are strictly adhered to so that when supplies arrive at the container factory their properties are already known. Nothing is left to chance, however. When the kraft and strawpaper arrive they are tested once again to ensure that they will stand up to the job they will have to do.

Similarly, at key stages in the manufacture of the actual corrugated board, tests are applied to make sure, for instance, that the corrugations, on which strength depends, are regular and perfectly formed and that the corrugated strawpaper is adhering firmly to the kraft liner. Stringent tests are now applied to the board to establish its resistance to flat crushing and to puncture. These, and final compression tests on the completed case, simulate some of the worst hazards found in practice.

As for uses, the corrugated fibreboard case goes everywhere, carrying every sort of mass-produced product, protecting it all the way from factory to shelf or counter. Bowaters are turning out fibre containers every hour of the day, six days a week.



Testing for fluting consistency . . . crush resistance. . . puncture point . . . compression limit

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SINGLE-FACE CORRUGATED ROLLS AND CUT PIECES

—coarse and fine flute

INSTANT HOT WATER FROM STEAM

with automatic temperature control

Hot water, plenty of hot water from tepid to very hot, instantly, cheaply — that's what you want and that's what you get with a Leonard Thermostatic Steam Water Heater. Hot water is made only when it is wanted and where it is wanted. There are no heat losses through storage or radiation. No expensive piping or equipment required. The Leonard Thermostatic Steam Water Heater is easily and quickly installed — no upsets, no delays. It is widely used in Laundries, Tanneries, Textile Mills, Breweries, Dairies, and other Food Industries, Tinplate Works, etc.

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That means that in all the subsequent operations you can hold far finer tolerances. You eliminate "multiplying" errors; you eliminate spoiled sheets; you reduce scrap.

The Bliss Squaring Slitter may also be used to cut large body blanks or strips for press requirements: trim the sheets in the first operation and slit the sheets into strips or large blanks on the second operation table.

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for the bacon curer

I.C.I. GRANULAR SALT is a new grade of coarse vacuum salt, specially designed for use in place of crystal salt for the tank curing of bacon.

EASILY HANDLED

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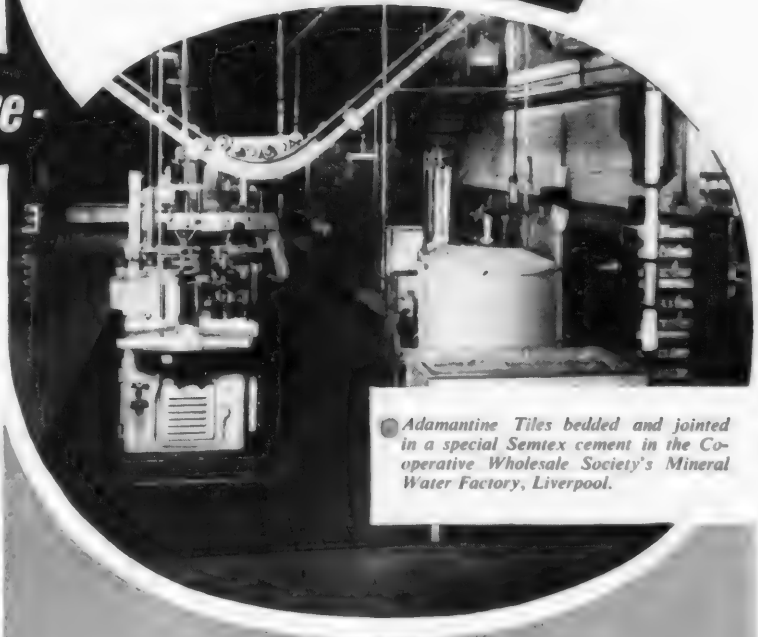
There's a Spanner in the works . . .

but not here -



Adamantine Tiles bedded and jointed in a special Semtex cement in the Co-operative Wholesale Society's Mineral Water Factory, Liverpool.

A real "spanner in the works"—that's industrial corrosion. It undermines efficiency as it undermines property. Positive defence against this danger in food factories is provided by Semtex Industrial Division, with its specialised service for the installation of corrosion-resistant floors and structures.

In the operation of this service careful selection is made from the range of special compounds which Semtex has available to counter corrosion arising from any conditions—acids, alkalis, heat, damp, and so on.

These materials (linings, membranes, bedding and jointing compounds, and protective paints) are keyed to specific requirements and rightly applied, provide the highest degree of resistance to corrosive attack.

If *you* are concerned about corrosion consult Semtex. The advice and experience of this company are always at your service.

SEMTEX

INDUSTRIAL DIVISION

A Bovis Company

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This photographically illustrated booklet not only describes in detail the full range of Semtex cements but also presents the factors governing the choice of cement for specific types of corrosion-resistant work. Send for a complimentary copy today.

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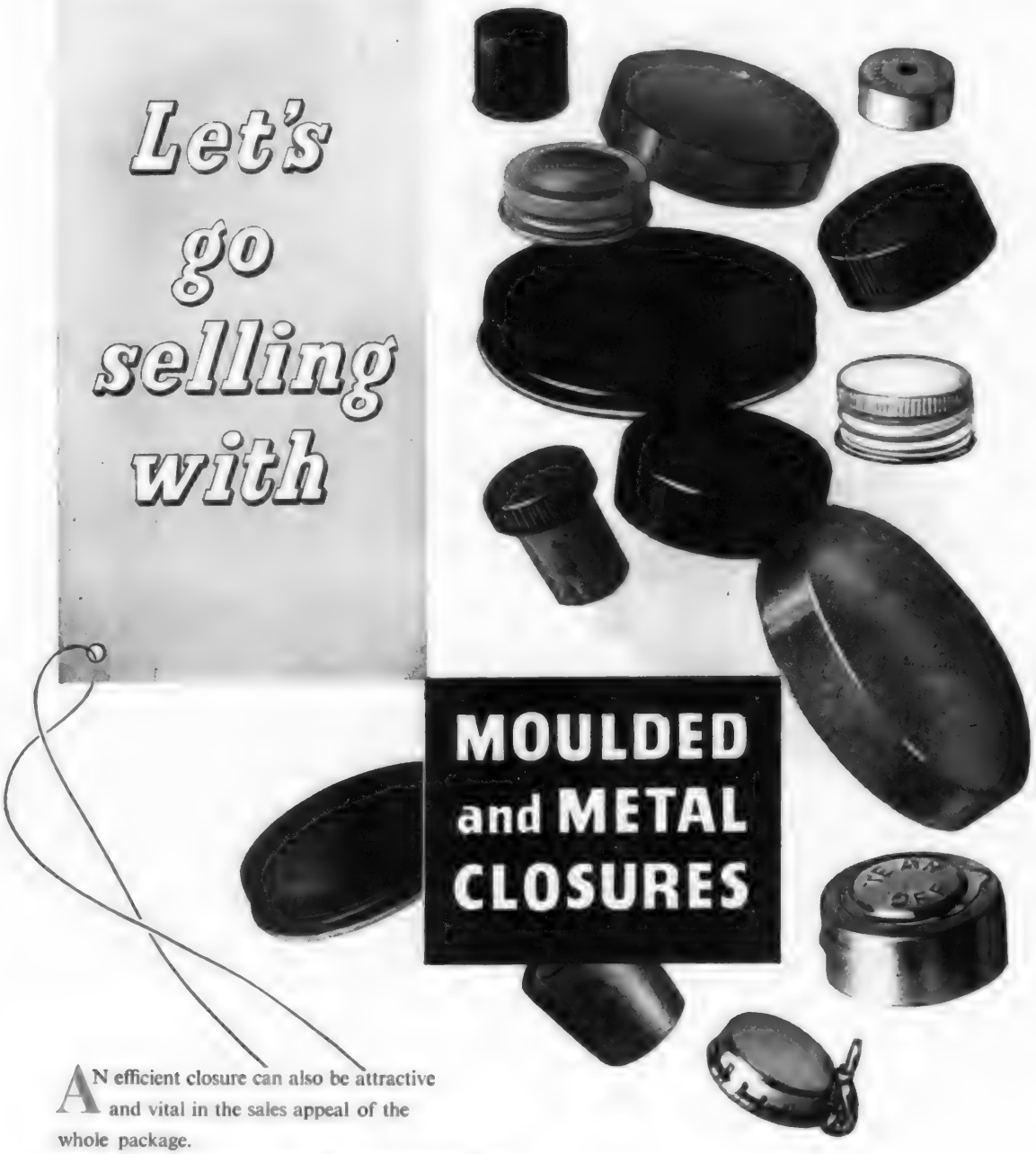

MOULDED and METAL CLOSURES

AN efficient closure can also be attractive and vital in the sales appeal of the whole package.

We can design and supply plain, fully decorated tin-plate or aluminium closures, cork stoppers and plastic caps from black to the most delicate pastel shade, with exquisite embossing.

When the contents of the container have been used and the label washed off, a distinctive closure will go on telling your story.

UGB
CLOSURE DIVISION

UNITED GLASS BOTTLE MANUFACTURERS LTD

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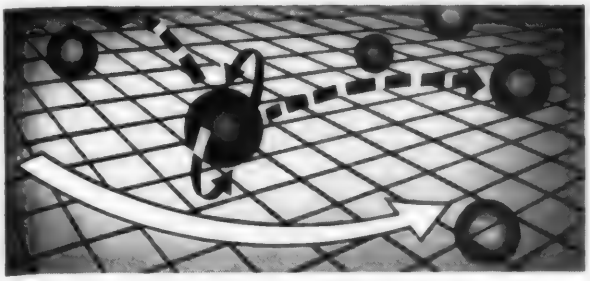
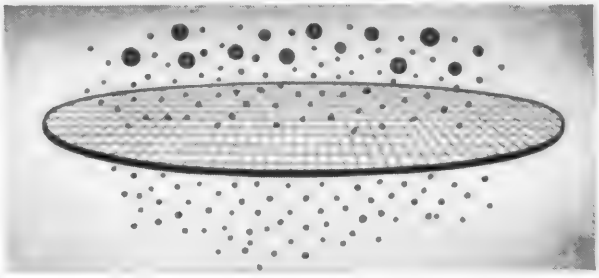
It took Slow-Motion Photography to Explain their *High-Speed Action!*



The rolling motion means that the particles (shown here widely separated, for clarity) go either *through* an aperture or past it. The material thus cannot "blind" in the mesh.

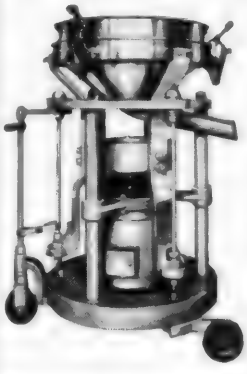


The spinning motion means that the larger particles, moving with less velocity, tend to stay *at the top;* and the area of mesh exposed to the small particles is thus much greater.

Only when filmed in slow motion was the extraordinary throughput of Russell Gyratory Sieves fully explained. The unique rolling-spinning motion imparted to the material prevents "blinding" by oversize matter and keeps the mesh continually clear for the rapid passage of fines.

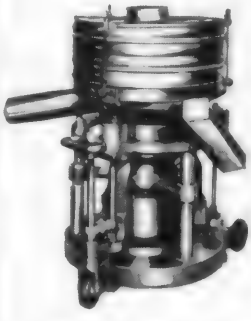
"Non-Blinding" Gyratory Action gives throughput **12 to 18 times** that of same area of shaker screen!

STANDARD (Constant-Speed) Model



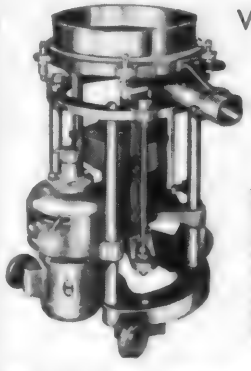
Standard (Constant-Speed) Model. (Approx. 2' × 3'; weight 4¼ cwt.) giving efficient sieving even with 300 mesh; also ideal for straining.

CASCADE Model



Cascade Model: combines gyratory action and automatic rejection to give the highest level of sieving efficiency. Available as mobile stand model (approx. 2'×3' 6"; weight 4¼ cwt.) and as ceiling-mounted model (approx. 2' 3" floor aperture, 2' 1" projection below ceiling; weight 6½ cwt.)

AUTOMATIC REJECTION



VARIABLE SPEED Model

Variable Speed Model (approx. 3' 3" × 4'; weight 5¾ cwt.) giving variable gyration, 1,000-3,000 r.p.m. for high-quality sieving with ultra-fine meshes.

Write to-day for full illustrated Literature and details of 28 days' trial.

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Collapsible metal tubes for foods

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With this special version of the Patent 'Rapid' Mixer you merely feed the flour and fat direct into the machine. The special type of agitator breaks up the fat and provides a fine even mixture with the flour.

This machine can be supplied in a size to suit your needs and where required can be fitted with a heating jacket to keep materials at the right temperature for efficient working during extremely cold weather.

This Gardner mixer will raise the quality of your mix, speed your output and reduce costs. A practical demonstration using your own mix materials can easily be arranged. Get in touch now with

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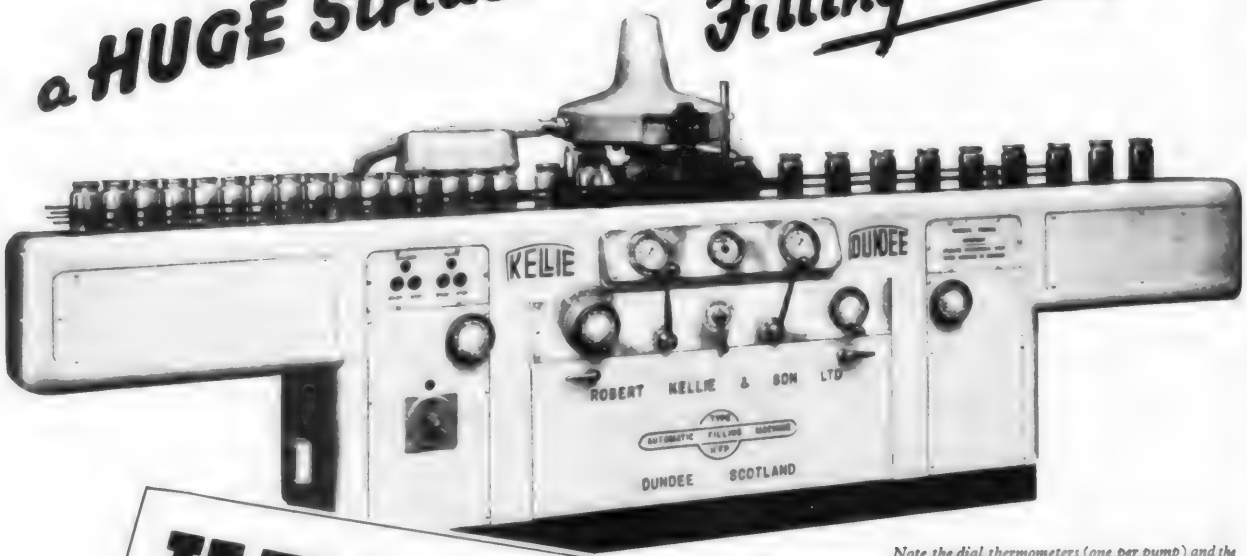
a HUGE Stride Forward in Container Filling Technique



Note the dial thermometers (one per pump) and the tachometer to indicate filling rate per minute and record total fillings during run.

KELLIE'S NEW AUTOMATIC STRAIGHT-LINE FILLING MACHINE

for liquids, semi-liquid and viscous products including jams, jellies, marmalades, soups, syrups, lemon curd, creams, etc.

A FEW OUTSTANDING ADVANTAGES

Infinitely variable filling rates
(according to product and type of container)
30 to 240 1 lb. containers per minute
60 to 240 ½ lb. containers per minute
30 to 120 2 lb. containers per minute
30 to 80 3 lb. containers per minute

Infinitely variable conveyor speed
Automatic continuous container feed and delivery from 30 to 240 per minute on stainless-steel-slat conveyor.

Comprehensive safety standards
Pumps and conveyor electrically interlocked (both starting and stopping). Foolproof mechanical interlocking between pumps. Full enclosure of driving mechanism and electrical controls. Smooth contouring for hygiene preservation.

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Smooth and accurate filling, non-spilling, non-aerating, micro-regulated whilst machine is running.

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136 to 544 gallons per hour from *each* of two pumps—operable separately, simultaneously or consecutively.

Perfect protection of products
Whole-fruit strawberries and cherries, for example, are not even bruised.

Write at once for the complete specification and learn just how much you will gain in speed, efficiency, accuracy, economy and convenience. Specify KELLIE TYPE 11FP (Patents pending).

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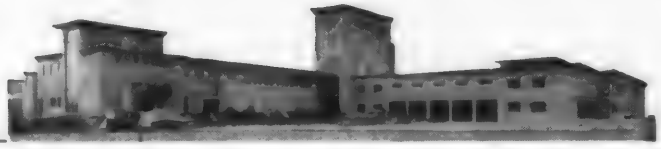

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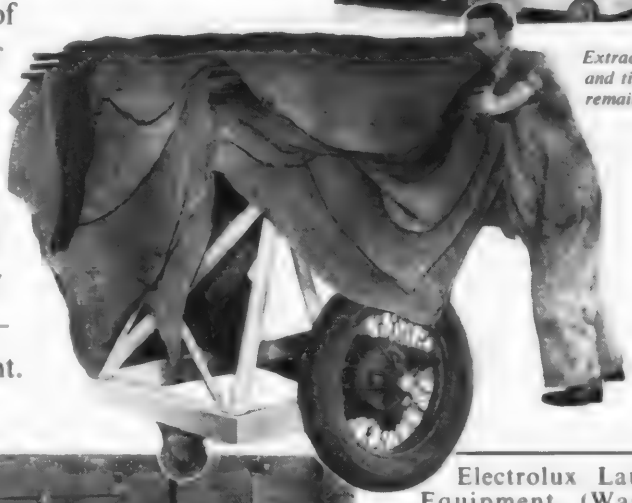

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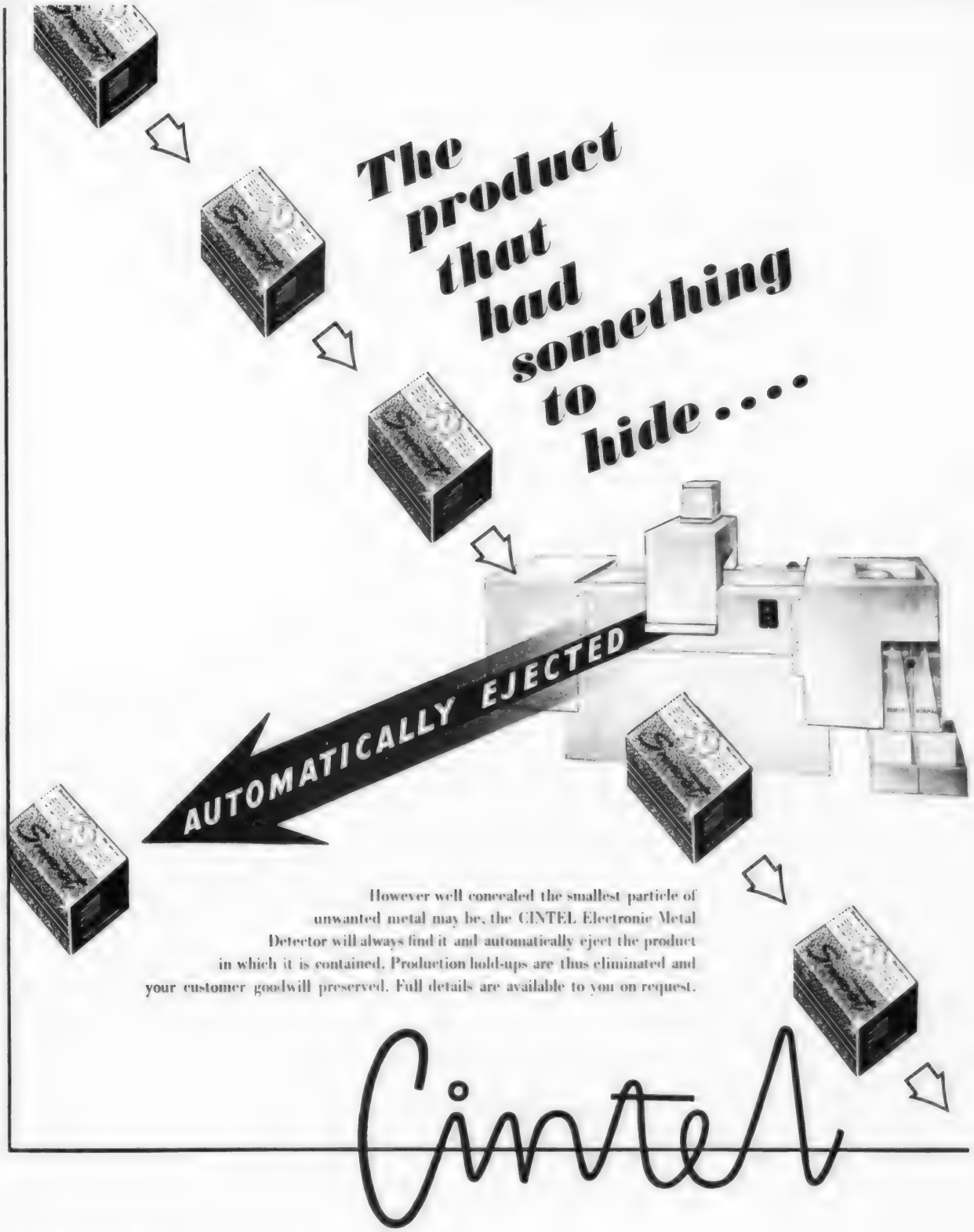

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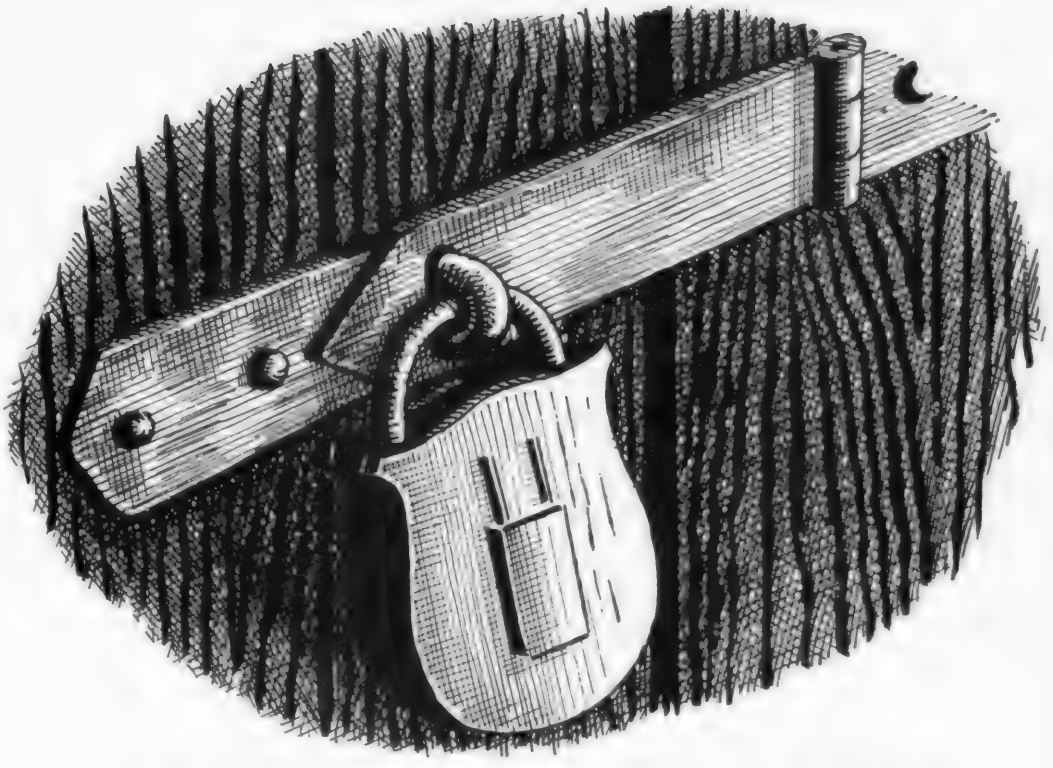

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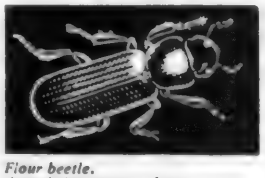

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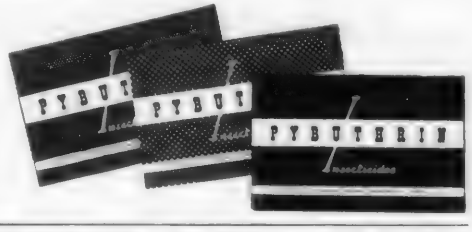

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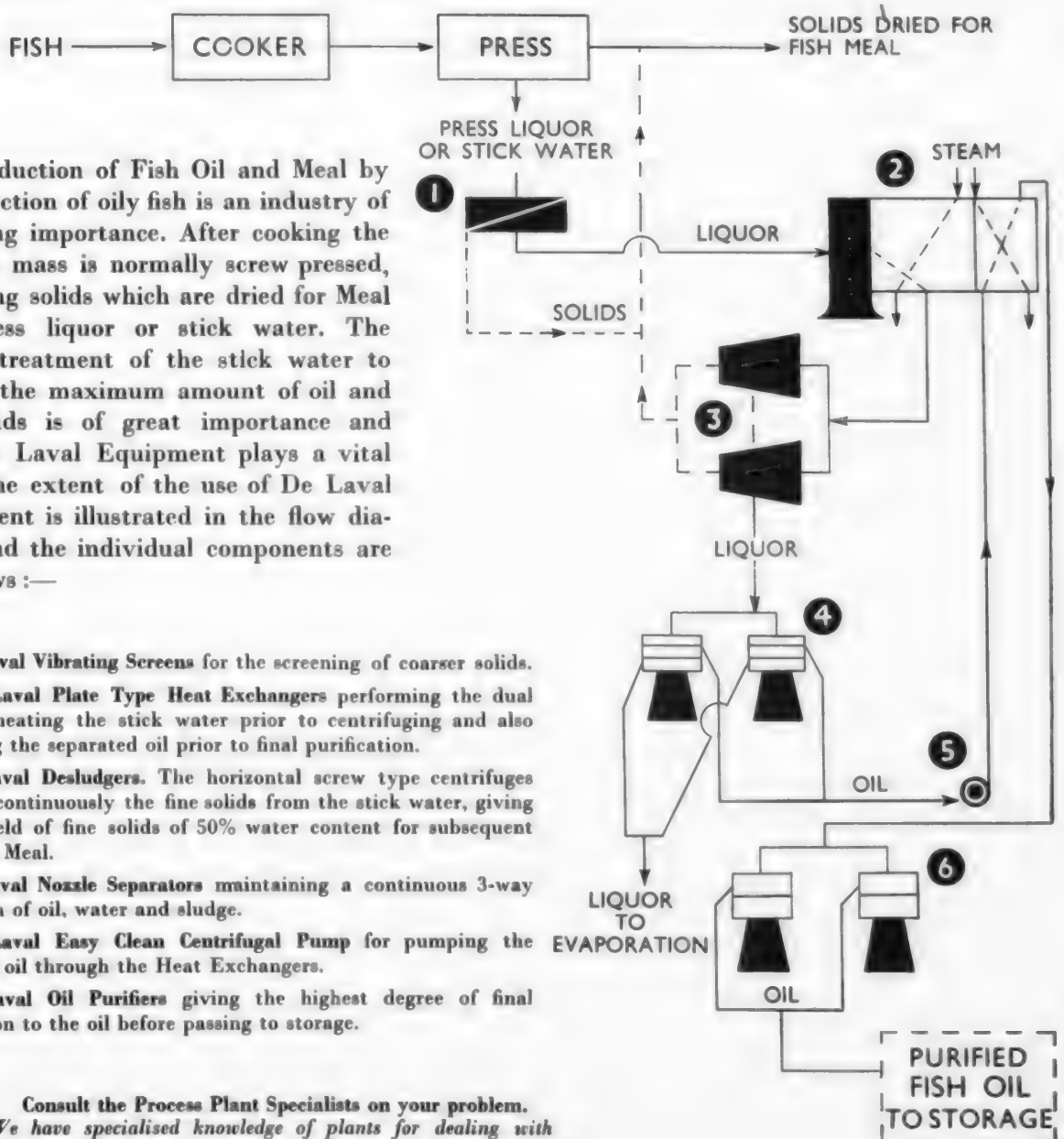

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FOOD MANUFACTURE

Vol. XXIX. No. 8 · Published Monthly · August 1, 1954

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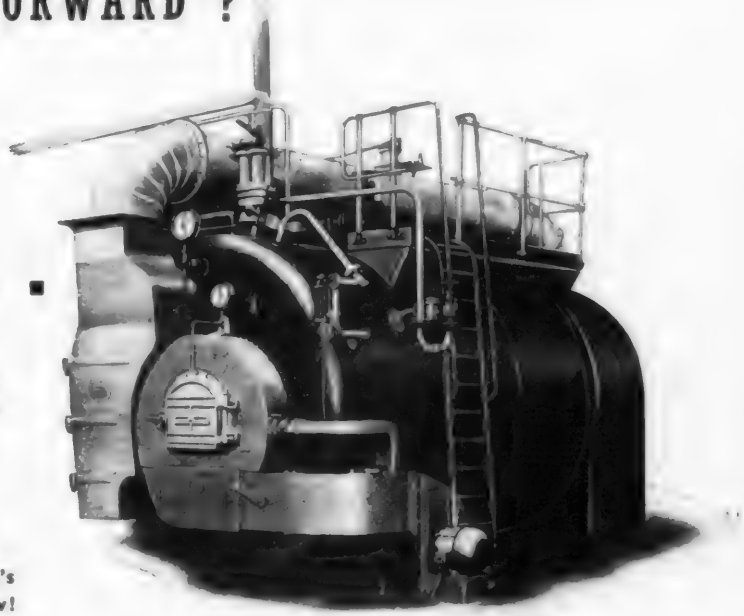

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FOOD MANUFACTURE

Vol. XXIX, No. 8 August 1, 1954

The Food and Drugs Amendment Bill

ADDRESSING a meeting of the Food Education Society, with Lord Hankey in the chair, Lord Sempill emphasised that it was the medical scientist who should have the greatest say in what we should eat, and not the chemist, generally called a "food scientist." Whatever was done to food, he said, ought to be decided by the effect on human health and the consumer must be protected against himself and against the wayward choice of food into which his appetite might lead him.

Although the speaker felt that some progress had been made in the direction of the improvement of the existing regulations governing the addition of any substance to foods, it was largely decided by the Ministries concerned with their production, for example, the Ministry of Food, today preparing for retirement, and the Ministry of Agriculture and Fisheries. It was obvious that the health of the consumer did not hold the commanding position that it should and he stressed that these Ministries could not proceed without the guidance of the Ministry of Health, who should have the deciding voice.

Referring to the Food and Drug Administration of the U.S., Lord Sempill said that they had extensive laboratories and a large research staff. At the enquiries held, experts were not encouraged to give their opinions only, but had to present clear evidence on each point which was filed as an exhibit. No such highly developed laboratory and examining mechanism existed in Britain, where reliance had often to be placed on the decisions arrived at in the U.S. before policy or action could be determined.

While paying tribute to the active work being done by Medical Officers of Health, the speaker had no doubt but that the laboratory facilities at their command could with advantage be extended, as well as the inauguration of a service on a national basis broadly similar to that existing in the U.S.

Although our American friends were most helpful, it was obvious that we should plan to stand on our own feet. It was the work undertaken by the Medical Research Council which led to an official decision on the part of the Government of the U.S. to forbid the use of agene as an "improver" in bread—a decision which was quickly acted upon. Although a similar decision was arrived at in Britain, it had not yet been implemented. Some 10 years or more had elapsed since the basic research was undertaken on the toxic effect of agene associated with the name of Sir Edward Mellanby.

Lord Sempill felt sure that in the course of its consideration the Food and Drugs Bill would be much improved, especially as a number of members of both Houses thought on like lines. He hoped that when it eventually became an Act the clear labelling of foodstuffs would be made compulsory.

The speaker went on to comment in some detail on jam, meringues, kippers, and other articles of food and reiterated his opinion that the voice of the medical scientist must be the dominant one. He gave some disquieting figures for the increase in degenerative diseases which demanded investigation and which were more likely to be caused by unsuitable feeding than by the effects of the increasing tempo of life.

The Role of the Food Manufacturer

ANOTHER slant on the matter of chemicals in food was given in Sir Frank Engledow's Presidential Address at the eighth annual general meeting of the British Food Manufacturing Industries Research Association.

Referring to the Fourth Annual Report of the Advisory Council on Scientific Policy, 1950-1, in which it was stated that the machinery which existed for testing the possible harmful effects of toxic substances in consumer goods was inadequate, Sir Frank said that the discovery of better tests was the task of chemical and physiological science, while provision, or at any rate approval, of the necessary organisation for applying them, was the grave responsibility of Government, but he asked what the food manufacturing industries were to do in the matter. Several lines of action were open, not all of which could be handed over, without support, to their Research Association. The point had indeed been reached at which the industries should searchingly examine their own attitude and form a constructive policy and not a defensive one.

The first thing was to ensure that all firms in the food industries made full use of the whole of existing knowledge and adopted a scientific attitude to it. Member firms would obviously be wise to keep in

close touch with the Research Association, but what of non-member firms? The Council in its latest (Seventh) Annual Report announced a projected development of great potential value to all firms. This was a Consultative and Advisory Unit, self-supporting by fees and within the Research Association, for visiting factories and also advising in other ways on production problems. Non-member firms would be able to use these facilities and it was reasonable to hope that they might thus be drawn increasingly into membership.

Members' strong support of the new development, by using it and recommending it, would be essential, for it might play, in time, an important part in the question proper of chemicals in food.

It was obvious that a second activity connected with chemicals in food was collaboration with the official committees concerned. The importance of the work of the Council and of the officers of the Association in connexion with the framing and application of regulations concerning chemicals in food and hygiene was, unfortunately, known only to a small proportion, even of member firms. It was only in this collaborative work that proper attention could be drawn to the practical implications of projected regulations.

Action of a third kind, which the food industries might take, was the establishment of a toxicology testing laboratory maintained by the industries concerned. This plan might have eventually considerable advantages. It could not, however, help to deal with the pressing difficulties of the moment, for these were not organisational but matters of evidence and experimentation.

It was apt to be thought that customary tolerance limits for long familiar substances, such as some of the metals, had been established from firm evidence. In fact, the limits of harmfulness of some of them, like the extent to which they were essential to the human physiology, were to some degree conjectural. Thus knowledge was necessary not only of potential new trace-additives to food, but also of some familiar ones, which were bound to find their way into food. Unless a change in the organisation and responsibility for toxicological tests held promise of the discovery of improved methods, it had at present little to recommend it.

Industry must be prepared to do much more than it does now in connexion with chemicals in food. It hoped, however, that any substantial change in the form or the spirit of regulations would be based on adequate physical evidence and thorough study of implications. It was possible to ask whether the suggested onus of proof could not be applied, for as good reasons, to what we daily absorbed in forms other than stored or processed foods and drinks. Twentieth-century man breathed an atmosphere increasingly loaded with chemical traces, the popular pharmacopoeia and the aids to beauty grew steadily, and his crops and stock were given, or fortuitously received, many small amounts of chemicals, for some of which the evidence as to possible cumulative toxicity was scanty. To consider all these facts was imperative; to use them to offset the seriousness of the problem of chemicals in food would be completely indefensible. For nothing could be worse in handling this problem than an atmosphere of debating or bargaining—one side seeking for words, in regulations, which proved that authority was facing its responsibilities, the other to exclude words which might have unpractical industrial implications.

Up to the present, industry's attitude to erroneous public statements about chemicals in food had been one of non-rejoinder on the ground that denial or correction on very technical points tended to give yet further publicity to the original utterance. Was this now wise? Might it not be well for industry to put forward its own reasoned case?

The preparation of such a case might make a valuable contribution to official discussions and to public understanding, and would ensure that the industries concerned were fully meeting their responsibilities by thoroughly probing all issues and not merely standing on the defensive.

Too Much Wine

SERIOUS concern is being felt by a number of the world's most important wine-producing countries because of the surpluses occasioned by a long term trend towards lower world consumption of wine. Industrialisation, changes in community life, and greater availability of non-alcoholic drinks are among the principal factors held responsible.

In Spain, about seven million hectolitres will probably be carried over unconsumed from 1953 production; France has an anticipated unconsumed surplus of about 17 million hectolitres in 1953-54.

Among the expedients adopted by European wine-producing countries to reverse the fall in wine consumption is a Spanish law requiring inclusion of a charge for wine with practically all meals sold in restaurants, whether it is drunk or not. In an attempt to cope with their surplus, the French government has ordered distillation into alcohol of seven million hectolitres and compulsory storage of further quantities. These measures can be carried out only at a considerable cost to wine producers and a substantial loss to the government.

French wine drinkers, averaging 138 litres per head per annum in 1952 (compared with 163·4 litres in 1931-1935), now favour the heavier wines, but these are often mixed with water at the dinner table.

In general, European wine consumption has risen since the war, but the present tendency is undoubtedly towards lower consumption.

Oban's Lobster Pool

So successful have been the experiments to maintain a lobster pool at Oban, that new equipment has been installed. Promoted three years ago by the Scottish Home Office and the Crofters' Supply Agency Ltd., the original plan involved the use of a disused factory as a storage and despatch centre for lobsters caught over the Western Isles. The old tanks have now been replaced by a new large improved iron type for the storage of thousands of lobsters during the summer months. Lobsters caught throughout the Western Islands are delivered by boat into the pool and kept alive by sea water pumped from Oban Bay.

As a result of the improved arrangements, the supply of lobsters for the London market will be considerably increased, and when demand is low, supplies can be stored until required.

When is a Cutlet not a Cutlet?

IN his report for the first quarter of 1954, Mr. H. H. Bagnall, Birmingham's City Analyst, strongly criticises those manufacturers who use words of well-established meaning to denote things which are of lower quality. Examples are methyl cellulose masquerading as meringue, and skimmed milk cheese as "selected" cheese.

The particular case discussed concerned articles sold as "beef cutlets" consisting of two parts of approximately equal weights. The outer layer, of fried material, contained only 29 per cent. meat, including 13 per cent. fat; the inner part contained 26 per cent. meat inclusive of 5·6 per cent. fat. The rest of the material in both parts was cereal filler and water. Even though the name has now been extended in culinary parlance to other preparations shaped to look like a cutlet, these, according to M. André Simon's "Concise Encyclopaedia of Gastronomy," consist mainly of "minced chicken mixed with some rather thick sauce, buttered, bread-crumbed, fried, and served with an imitation bone of macaroni, often ornamented with a paper frill, to make it look more like the real cutlet." There were no such embellishments for Mr. Bagnall's sample.

The makers of the offending article were duly informed that, in his opinion, a cutlet should consist of a slice of beef without additions, except possibly for a thin outer covering of a fried dressing. The reply, through a firm of solicitors, stated that they were unable to accept this definition and referred him to a case heard in a Petty Sessional Court in 1952 which concerned chicken cutlets containing 14 per cent. meat (including fat).

This summons was dismissed and Mr. Bagnall was apparently asked to accept this decision as setting a standard for cutlets in general—a situation which he found to be untenable. His opinion was that the case relied upon by the makers had no legal significance, and that it was "merely an expression of uninformed opinion by an unqualified bench."

We agree with Mr. Bagnall in his view that to accept 14 per cent. meat as a standard for a cutlet of any sort simply permitted the maker to spread the meat of one good honest cutlet to make four diluted ones.

Native Wheat in Irish Bread

WHEAT grown in Ireland was incapable of producing bakers' flour of sufficient strength to withstand the rigours of yeast fermentation over lengthy periods or the stresses imposed by mechanical processing, according to Mr. Edgar Anderson, chairman of a Dublin firm of bakers and confectioners.

At the beginning of the year, the grist used contained 25 per cent. of native wheat; it was then increased to 40 per cent. and finally to 50 per cent. to fulfil Government requirements. Mr. Anderson said that if bread of good quality were to be produced, strong imported wheat would be essential. Compared with such wheat, native wheat at the same extraction rate gave flour of a darker colour, yielded fewer loaves per sack, and was difficult to handle in modern mechanical baking processes. The bread made from such flour became stale more quickly.

The considered opinion of Irish bakers was that the maximum content of native wheat which could be satisfactorily carried in the grist, following a dry Irish harvest, was 50 per cent., and that in the event of an adverse harvest a much lower percentage was essential. Native wheat harvested under adverse weather conditions was incapable of making other than inferior bread. Ireland was probably the only country in the world where all native wheat required artificial drying.

Referring to the financing of native wheat in Ireland, Mr. Anderson stated that this had created a formidable problem for the milling trade. To carry his company's proportion, recourse had had to be made to extensive short term borrowing. The interest charged for the financing of the 1953 harvest had been upwards of £500,000. The cost of the 1954 harvest, expected to be greater than that of 1953, would exceed £16,000,000. The fixed price for native wheat was substantially higher than the world price.

A Nameless Prawn

A SUCCULENT and high-priced prawn of what may be an entirely new species has been discovered by Chilean fishermen.

It appears to be a close relative of a species of prawn which was last reported, in 1895, to be living at a depth of about one mile in the ocean between Panama and the Galapagos Islands.

The fishermen discovered the prawn when they started deep trawling along the edge of Chile's conti-

nental shelf on the recommendation of Dr. Fernando de Buen, a fisheries biologist sent to investigate the country's fisheries resources by FAO under its Expanded Technical Assistance Programme.

Some of the fishermen, who followed the advice of Dr. de Buen, made hauls of half a ton of the unknown species of prawn.

A sample was received by the FAO Regional Office for Western South America in Santiago and was identified by Prof. N. Bahamonde of the Chilean Museum of Natural History and by Dr. B. F. Osorio-Tafall, FAO Regional Officer, as belonging to the genus *Heterocarpus* of the family Pandalidae. The features of the prawn do not seem to agree with any of the *Heterocarpus* species reported in the available literature, and Prof. Bahamonde is making a detailed study of it.

Specimens sent to Dr. Chace of the United States National Museum, Washington, D.C., U.S.A., by Dr. E. Reed, Chief, Biology Branch, Department of Fish and Game, Washington, D.C., were identified as belonging to a species closely allied to *Heterocarpus hostilis* Faxon.

Lack of a name is not worrying Chile's fishermen. They are continuing to deep-trawl for the prawn and their catches are finding a ready sale at high prices in the Santiago markets.

Tough Sesame

WITH the advent of mechanical harvesting for so many crops, sesame has become a crop of declining popularity, its fragile pod necessitating costly hand harvesting. This trend may soon be reversed, for a variety of sesame has been found in Venezuela with unusually tough seed pods. From this native species, a new commercial variety of sesame that can be safely harvested with the same combine machinery used for corn is being developed.

According to latest information, enough of the new seed will be available by 1956 for general commercial growing in the United States, which may result in greater supplies of sesame oil entering the market for high quality edible oil.

Father of Mass Provisioning

ALTHOUGH historians are busy commemorating Florence Nightingale's epic work as "The Lady of the Lamp" in the Crimean War of 1854, little has been written about Alexis Soyer, "The Man with a Stove," without whose work on catering for the sick and wounded much of the nursing would have come to nought.

A whim of fortune brought Alexis Soyer on the scene. An aunt of Florence Nightingale happened to attend some of Soyer's cookery classes in England, classes designed to direct those out to feed London's poor. Soyer could be not only the chef to the Reform Club, not only the expert chef presiding over the preparation of important banquets in England with dishes for the gourmet costing a hundred pounds in days when a pound could purchase something of note, but also when the need arose to feed London's poor, the provider of a first-rate soup at a penny a quart and a Christmas dinner for 20,000.

To assess his exceptional versatility, his infinite capacity for inventing anything required to improve cooking, one need only summarise his achievements up to 1854. He was the author of books like "Soyer's Pantropheon, or a History of Food," and of a Shilling Cookery Book. He concocted a number of sauces and soups and an extract of meat; as for cooking vessels, it is barely possible to trace how many pots and pans, entrée dishes, vegetable drainers, baking dishes, and other utensils he introduced. Above all, he was the true champion of cooking stoves, being the inventor of a gas stove, a "cottager's stove," and a "magic stove," the latter being of the portable type burning spirit and hailed by the Press as suitable for explorers, sportsmen, and army men, as well as for Polar expeditions. A marquis gave this latter type great publicity by taking one to the top of one of the pyramids and there cooking a meal on it. Most famous of all was his army stove, "the most essential article of camp equipment" as even generals admitted. Soyer refused to patent it, but had his name inscribed on every stove.

And so to Scutari he went, because of that aunt of Florence Nightingale who wrote to tell of this remarkable Frenchman. Getting together an irregular team of so-called army cooks and orderlies, a noisy crowd he likened to a Billingsgate mob, he set them to work after surprising army officers with samples of nourishing soup. Before he came, a miserable army had been fed on salt pork and hard biscuits, with other meats ruined by bad cooking. In place of odd bits of coloured rag or even buttons formerly used by soldiers to identify their joints of meat, Soyer struck his first note for hygiene by substituting numbered skewers. He re-tinned coppers, had charcoal stoves and better ovens built, reconditioned 13 copper boilers left behind by the Turks, and began to supply over 2,000 patients with three nourishing meals daily.

Soyer showed his apprentices that the broth from boiled meat was also nourishing; that the pure white fat from it was supèrior to the rancid butter purchased from neighbouring bazaars. Since there was no salt or pepper available, he insisted on their supply and won his case. Army leaders and doctors were amazed at the improved kitchens set up by this versatile Frenchman. In all the history of cooking there can be no figure stranger than this eccentric but genial man, depicted in the Press illustrations of those days riding to work on his pony, cheered by a British army as the man who went to the cookhouse door with a purpose.

A general view of the Kenya Meat Commission Factory at Athi River, Nairobi.

Nairobi's New Meat Factory

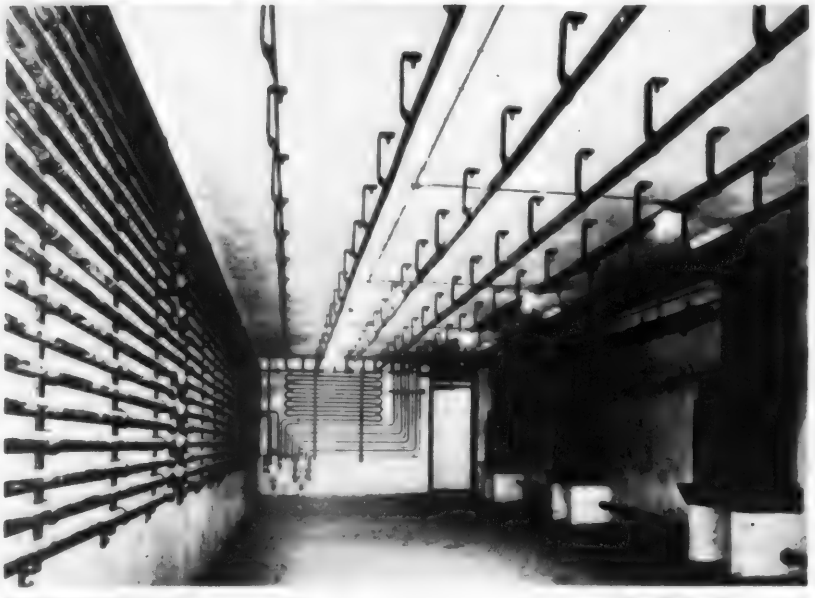
With a daily slaughtering capacity of 300 cattle and 250 sheep, rising to 500 and 750 respectively when the plant is in full commission, the factory of the Kenya Meat Commission, recently opened at Athi River, Nairobi, serves a wide area and is of considerable economic importance to the region as a source of home-produced meat for the English-speaking and Indian population. By-products will replace the items previously imported for the production of animal feedingstuffs and organic fertilisers.

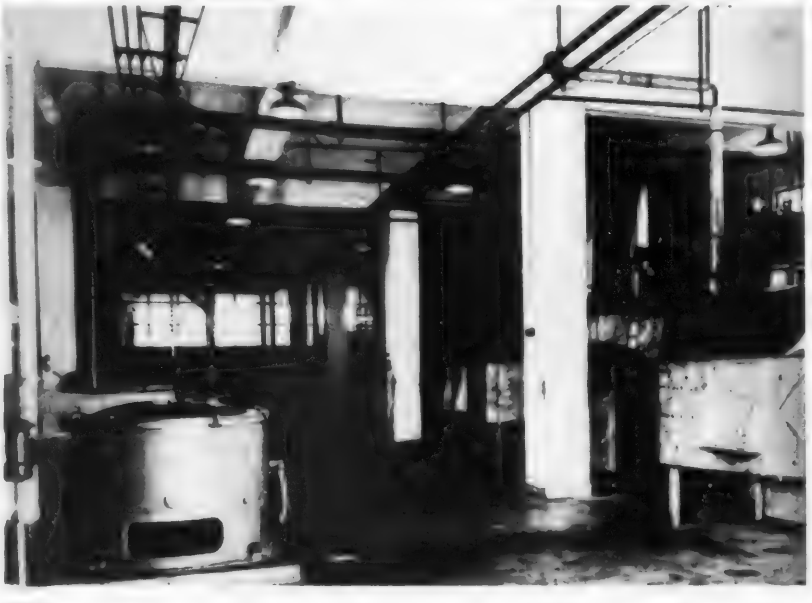
SLAUGHTERING at the Athi River Works is carried out on the second floor of the main processing block in accordance with present-day meat works practice, provision being made for Christian and Ritual (Mohammedan) slaughtering. Animals reach the slaughtering floor by an inclined ramp or drive way, having first passed through a series of water showers. After stunning in the orthodox type of pen, beasts are hoisted by two automatic landing devices, working alternately, to the overhead conveyor system, which is power driven and serves six dressing beds. A return rail is provided for the empty rollers. The beast droppers are of contemporary design, and air-operated flaying machines are used to remove the hide at this stage.

For carcass dressing, the latest type of dressing hoists are in commission; rails from the six beds are switched into a specially designed power-driven conveyor, incorporating three automatic spreaders to facilitate splitting.

Sheep slaughtering is carried out on the line system similar to American practice, the stunned animal being shackled and elevated to a round bar bleeding rail by a spiral elevator. In contrast

Animals reach the slaughtering floor by means of an inclined ramp.





to present practice in the United Kingdom, the entire sheep dressing operations are performed from a mechanically driven conveyor system, which is said to be faster and reduce man-handling. After weighing, sheep carcasses are passed to a series of holding rails and transferred to carriers by an inclined conveyor to the high level runway which is common with the cattle section.

All dressed carcasses are inspected by qualified veterinary officers throughout the various stages of slaughter.

Canning Block

It is anticipated that the canning factory, a three-storey building, will be in operation later this year. The boning department on the second floor is equipped with a monorail system, linking up through a corridor and air lock with the main freezer block. The quarters of beef are received and weighed, and band saws, with specially fitted stainless steel tables, are situated between three large boning tables.

Adjoining the boning room is the kitchen, where the equipment installed includes cooking tanks, can washer, meat curing drum (a newly developed machine for the production of corned beef), and green meat cutter with conveyor.

Corned Beef Manufacture

In the production of corned beef, the meat after boning out is cut in a rotary cutting machine for the production of irregular shaped pieces, roughly about 1¼ in. each way, which are then parboiled.

Pickling is normally the next operation; prior to the development of the meat curing drum this was always accomplished by the use of brine pickle in suitable tanks for a period of 14-18 hours.

The meat curing drum provides a similar result by using a dry salt mixture in which the cooked meat is rotated to give an even and thorough "pickle." This opera-

Top: **Carcass splitting and trimming operations.**

Centre: **Cold room rail with cooler coils and blowers along the wall.**

Bottom: **By-products plant with centrifugal fat extractor, melters, and percolating tanks.**

tion takes only a few minutes, and has the additional advantage that the strength of the pickle, and consequently the results obtained, are always constant. This is ensured by using carefully weighed amounts of "pickle mixture" in relation to the quantity of meat, whereas liquid pickles can vary in their effect.

The machine comprises an irregular egg-shaped drum of stainless steel construction mounted on a suitable framework and driven through a machine cut totally enclosed worm reducer gear to an electric motor.

It is loaded by means of a door at the top and is self-discharging by the same door in its bottom position.

The oleo plant room showing the cooling tank on the left, mincer in the foreground, and two melters in the background.

The first floor is devoted entirely to canning, two lines of can stuffing machines, podging equipment, and double seaming machines, being operated. Eight horizontal retorts have been installed, also a floor-to-floor gravity operated can dropping device. For the production of meat extract, a triple effect evaporator and two large stainless steel extract pans, fitted with power-driven agitator gear, have been installed.

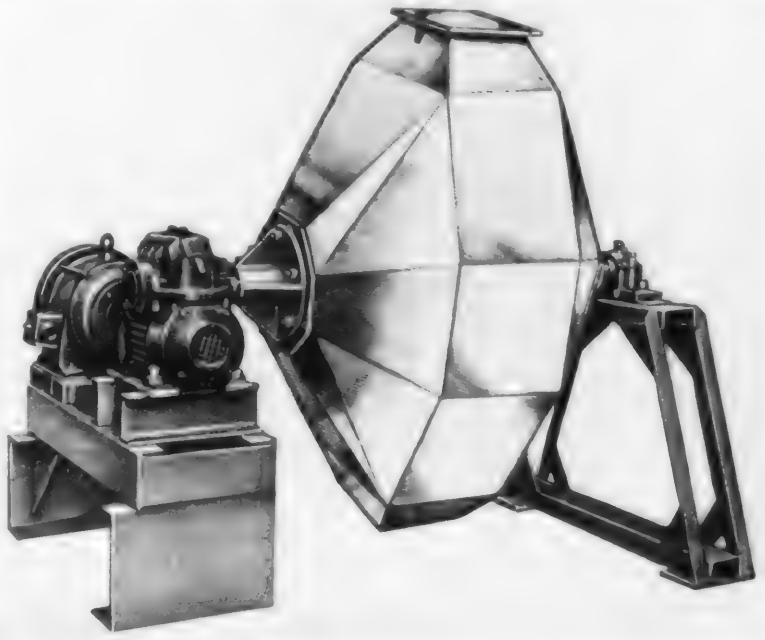
Adequate space has been provided on the ground floor so that canned products, after weighing, can be incubated for a period of 10-14 days at a temperature of approximately 90°F. It is on this floor that inspection of the cans is carried out, prior to labelling, packing, and despatch.

By-products Handling

The preparation of oleo oil from the kidney and bowel fats of cattle and sheep is carried out on the first floor, where the raw fats pass through a rotary cutter, reducing them to strips. These are placed in a washing and cooling tank 32 ft. long by 4 ft. wide by 4 ft. deep provided with a working platform on one side and fitted with a system of cooling coils. The chilled fat from the tank is fed on to a table and then into the hopper of a fat hashing machine with an hourly throughput of approximately 3,000-4,000 lb. of fat. After hashing, the fat is placed in two steam jacketed melting kettles, fitted with agitator gear. When the rendering operation has been completed, the liquid oleo is piped by gravity to two refining kettles mounted on a chequered plate steel platform, the refined oleo being held in two large storage tanks. Both refining kettles and storage tanks are situated on the ground floor.

Preparation of Tripe

Machinery for the cleaning, dressing, and cooking of tripe is also accommodated on the first floor. Cattle and sheep paunches are received from the second floor by means of chutes and placed in cold water tanks before being scalded in circular vessels, fitted with agitator arms. Other equipment on this floor is a large tripe dressing machine, embodying an elevator and fat collecting tank, a revising table, tripe cooking



Meat curing drum. *Photos Kenya Meat Commission.*

tanks with perforated false bottoms, steam heater units and covers with balance weights, and two steam jacketed pans for fat.

Hides, Heads, and Viscera

Hides are also received on this floor, where they are washed and placed on rails and weighed. The receiving tables placed beneath the chutes receive the heads prior to being split either by the sheep head splitting machine or by a larger machine installed for splitting cattle heads. Tables are provided for viscera separation and for the examination of tongues and heads.

A length of runway, connecting with the lift, is provided for condemned meat, and a carcass crushing machine is arranged to discharge material to the hoppers of the melters situated on the ground floor below.

Casings and other Products

Casing cleaning machinery for cattle and sheep casings is located on the second floor, together with salting and measuring tables, tanks, offal hashing and washing machinery, bone saw, and mechanically operated hoof puller. A large foot washing machine, scalding tank, and hoof cooking tanks are provided on this floor for the production of neatsfoot oil. Each cooking tank, fitted with a special tipping cage, has a capacity of 360 hoofs. The neatsfoot oil is fed by gravity to two refining pans on the ground floor below and, finally, into a storage tank.

Dry Rendering of Fats and Bones

In the by-products plant on the ground floor of the main slaughter block, edible and inedible fats and bones, etc., are processed by the dry rendering method. The plant includes six melters, each having an approximate capacity of 2,600 lb. of raw animal by-products (cut or crushed) per charge; the processing time for each charge varies from three and a half to five hours, according to the moisture content. Percolating tanks, four steam turbine centrifugal fat extractors with 48 in. diameter baskets for the reclamation of further liquid fat from the residue of the materials after discharge from the melters, fat collecting tanks, pumps, and settling and refining tanks comprise the complete plant. A grinding, screening, and sacking plant, with magnetic separator, has been installed for handling bone meal.

Dried Blood

For the collection and treatment of raw blood, receiving and coagulating tanks are mounted on an overhead platform, so that after pressing by hand and draining off surplus moisture, the blood is fed into two driers. Each of these has a nominal capacity of 1,600 lb. per charge, and dries the blood in approximately six to eight hours. After drying, the blood is ground in a grinding and sifting unit, and sold for fertiliser.

For the processing of condemned carcasses, a vertical digester with extra large charging door has been provided; this enables carcasses of beef to be handled without any further cutting. The materials from this digester can be processed in the final stages of the dry rendering plant, since they are sterilised by this treatment.

The hides store is a self-contained building where, after preliminary washing, the hides are trimmed, cured in large concrete tanks, and subsequently stacked and dry salted.

Adequate water has been made available by the provision of a bore hole. Two horizontal oil-fired steam boilers, each working at 100 lb. per sq. in. pressure with an evaporative capacity of 12,000 lb. of steam per hour, are installed.

Sufficient head room has been allowed in the construction of the different blocks to provide good ventilation and comfortable working conditions in a factory which has extremely good natural and artificial lighting.

SOME SUPPLIERS OF EQUIPMENT

Main equipment contractors: *Industrial Waste Eliminators.*
Refrigeration: *J. and E. Hall.*
Boilers: *Danks and Co. (Oldbury).*
Weighing equipment: *W. and T. Avery.*
Flaying machines: *Kingley Equipment Co.*

Prelude to Microbiology

THERE is always a need for books giving a wide introductory background to a particular branch of science. One, recently published, endeavours to form such an introduction to the organisms now included under the heading of Microbiology, in its widest sense.* As the author points out, too many students have an insufficient knowledge of the range of their subject, and of the contributions of the earlier workers. A glance through a bacteriological text-book of, say, 1890 fills one with wonder at the enormous ground covered in the preceding 20 years, apart from the slower but considerable development during the previous 200 years.

Mr. Gray's book gives a well-balanced summary of the scope and methods of microbiology, with chapters on viruses, bacteria, yeasts, moulds, and fungi (surely this should read "and other fungi"), algae, and protozoa. Following these are informative chapters on soil microbiology, and on sea and river organisms, with a final and rather less successful chapter on applied microbiology covering some aspects of the food and fermentation industries.

The style is simple and readable, with an almost eighteenth century predilection for capital letters. In the preface, the author rightly stresses the importance of the historical approach, and it is therefore disappointing to find so little mention of the pioneer work of Pasteur and Koch.

In addition, there are one or two statements that should be corrected in future editions: Cryptogams (p. 87) are not "also known as Thallophytes," and makers of champagne would be shocked to hear that carbon dioxide is (p. 163) "forced into the wine after fermentation."

The book may be recommended as a compact and inexpensive introduction to micro-organisms.—L. D. G.

* *Microbiology, An Introduction.* By Ernest Gray, M.Sc., M.R.C.V.S. Pp. 175 + xii. Crosby Lockwood. Price 10s. 6d.

The Manufacture of Active Dried Yeast

R. A. Benesch

In view of the world-wide importance of yeast manufacture, it is curious that dried yeast has not been introduced into bakery practice, in view of its commercial advantages. Its main drawback is that during the drying process, the yeast cells are modified, resulting in a loss of baking qualities. The author describes new methods for investigating the essential differences between compressed and dried yeast, which might lead to improvements in the drying process.

FROM small beginnings, the manufacture of bakery yeast has grown to a great industry. Data published in 1934 showed that the U.S.A. and Canada were producing 135,000 tons and Europe 143,000 tons of compressed yeast per year. Since in France, for instance, the production rose from 18,000 tons in 1934 to 36,000 tons in 1949, present-day world output may be much higher than 278,000 tons.

Manufacture of Dried Yeast

Because of its perishability, compressed yeast cannot be stockpiled either in the factory or by the customer, and its high moisture content (70 per cent.) makes shipping and distribution very expensive. There have been many attempts to manufacture a more stable product, the first dried yeast, named "Florylin," being used commercially in Germany after World War I. The use of this product proved successful in tropical climates, on board ship, and in the home kitchen. During World War II, quantities of dried yeast were manufactured to supply the needs of the armies. In France, it was produced and stockpiled in the expectation of the landing of allied troops, as owing to the destruction of railways and highways by bombing, the regular distribution of compressed yeast was impossible. However, in spite of all this, dried yeast was never adopted by the trade except for special climates or in exceptional cases.

From the commercial viewpoint, it is certain that the rise of production costs of yeast due to drying could be counterbalanced by the saving in shipping and distribution costs, seeing that dried yeast represents only 35 to 40 per cent. of the weight of compressed yeast. There would also be many advantages in substituting the daily distribution necessary for compressed yeast by a weekly or monthly one.

The shortcomings of dried yeast may be summarised thus:

1. Weight for weight of solids content its fermenting power is lower than that of compressed yeast.
2. On storage, its stability deteriorates rapidly.
3. Dried yeast adversely affects the physical properties of the dough, resulting in a smaller volume of bread than is obtained with compressed yeast.

The only known method of investigating the behaviour of yeast during the drying process is by counting the number of dead cells by colouring with methylene blue. Since the modern drying processes proceed at very low temperature, only a small percentage of yeast cells are killed; the change in the properties of the yeast must therefore be attributed to a change in the living cells. Other methods, such as the fermentation test, already used for investigations on compressed yeast, give data about the finished product and do not indicate the reason for the difference between the results of the two types of yeast.

There is no reason to believe that it may be impossible to produce a dried yeast having the same, or nearly the same, qualities as compressed yeast, provided the drying process is carried out correctly. The first requirement is to ascertain what happens to the cells during drying and whether there are essential changes in the cell matter. H. Jørgensen[1] first mentioned in his studies some important differences in bromate effect. Some others have been found by the present author concerning:

1. Permeability of cell walls.
2. Water adsorption by the cells.
3. Reduction power.
4. Activation of proteolytic enzymes.

H. Jørgensen has demonstrated that when dried yeast is diluted with water, large amount of glutathione may be found in the filtered liquid, which does not happen with compressed yeast. The author tried to show this difference by the simple titration of the aqueous extract of yeast by iodine solution. This method was selected in spite of the fact that yeast has a very high reducing action, tests with methylene blue proving that this reaction takes place only in the presence of the yeast cells and not in the aqueous extract. Since it is evident that the yeast cell gives off an iodine-titratable substance, the titration must probably concern glutathione only.

The iodine titrations demonstrated that there is not only a great difference between compressed yeast and dried yeast, but also between dried yeasts of different quality. This fact is independent of the opinion of H. Jørgensen about the bromate effect and constitutes real progress in the knowledge of differences between the two types of yeast.

The author found a very important difference in what has been called the consistency of yeast by J. White,[2] who devised a new and simple viscosimetric method of determining the consistency of yeast which is in direct proportion to the percentage of extracellular water in the yeast. The moisture contained in yeast consists of the protoplasmic intracellular water and that between the cells. The percentage of this extracellular water determines the consistency.

Two compressed yeasts with equal solids content may have a different consistency and show in aqueous solution a different viscosity. This fact is demonstrated by mixing compressed yeast with

small quantities of salt. The change of osmotic pressure increases the proportion of extracellular water and the yeast becomes liquid.

The author applied this method to dried yeast diluted with water in order to give exactly the same proportion of solids content in all the samples. It was found that all the dried yeasts investigated were rather less viscous than compressed yeast as shown below:

	Time necessary to drain 250 ml. seconds
Compressed yeast ..	365
Dried yeast A ..	145
.. .. C ..	210
.. .. D ..	50

The viscometer used consisted of a glass tube of 250 ml. capacity. The time necessary to evacuate the liquid in the tube through an orifice of 2 mm. gives comparative values of the viscosity. Two hundred grams of compressed yeast are diluted with 100 ml. of water. Dried yeast was diluted in proportion to its content of dry matter.

The only possible explanation of this fact is that when dried yeast is dissolved in water, its cells absorb water in different degrees approaching more or less their original composition before drying. This is of great importance if dried yeast is to attain the same quality as the compressed type. Dried yeast, which has lost the ability to reabsorb cell water, is like compressed yeast autolysed by salt. As is well known, autolysed yeast has a very bad effect on the dough. Autolysis is accompanied by an expulsion of an intracellular substance, caused by a change in the permeability of the cell walls.

The reduction of methylene blue by yeast was first mentioned by Hahn[3] in 1902, but never applied in the investigation of yeast drying problems. The author has found that compressed yeast reduces methylene blue solution in a matter of minutes, while dried yeast does the same in a few seconds. The reaction was so rapid, that it was impossible to find any difference between different dried yeasts. The rate of reduction depends on the concentration of H-ions and is much slower in acid solutions (pH 4·3), as is shown by the following data:

	Minutes
Dried yeast A	2
.. .. C	6
.. .. D	3

These compare well with the other tests. They show considerable differences between compressed and dried yeast and a lesser one between different dried yeasts.

The problems of the proteolytic enzymes in flour and their action in the dough may still be controversial and the bromate theory of Jorgensen may not be the last word on this matter. It is certain that yeast exercises some action on proteolytic enzymes of the papain type. Here a great difference between the two kinds of yeast was found. The test was made with a mixture of gelatin and a papain solution, by the titration with formol and 0·1 normal caustic soda solution. The formol titratable nitrogen of gelatin and papain was determined before each test. Bacterial contamination occurred in a very few cases, as proved by microscopical examination. The tests were carried out at 35°C. in 12 hours without agitation and in two hours with agitation in a water bath. The solutions were made neutral because the action was faster than at pH 4·3. In 12 hours without agitation the following results were obtained:

	0·1 N NaOH ml.
Compressed yeast	2·0
Dried yeast A	10·2
.. .. C	5·5
.. .. D	6·3

In an experiment with agitating for two hours, the difference between the dried yeast was more important:

	0·1 N NaOH ml.
Dried yeast C	0·8
.. .. D	2·8

The effect on papain activity by dried yeast is shown to be two or three times higher than for compressed yeast.

Conclusion

Some essential differences between compressed and dried yeast in its physiological properties are demonstrated by a series of simple methods. There is a satisfactory concordance between the results of these methods and the practical improvements achieved. Based upon these methods, it may be possible to direct further investigations in yeast drying in order to obtain a product with qualities approximating to those of compressed yeast.

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[3] Hahn, M., *Münch. mediz. Wochenschr.* t. 49, 1902, p. 595.

Food Research

INFORMATION on the official and semi-official organisations in the United Kingdom undertaking research on food is contained in a recent work.*

The field of research covered is that of the processing, storage, and transport of food; work on food production and on nutrition is included only when it is part of the work of organisations concerned with food preservation.

The 15 research organisations dealt with are The Food Investigation Organisation of the D.S.I.R., the British Food Manufacturing Industries Research Association, the Scientific Adviser's Division of the Ministry of Food, the Fruit and Vegetable Canning and Quick Freezing Research Association, Long Ashton Research Station, The Research Association of British Flour Millers, British Baking Industries Research Association, The National Institute for Research in Dairying, The Hannah Dairy Research Institute, the Herring Industry Board, the White Fish Authority, the Refrigerated Cargo Research Council, the Pest Infestation Laboratory of D.S.I.R., the Infestation Control Division of the Ministry of Agriculture and Fisheries, and the Printing, Packaging and Allied Trades Research Association. The publication also includes a list of the names of research workers and a subject index.

* *Research on Food Preservation*. Pp. 55+iii. Published for D.S.I.R. by H.M.S.O. Price 2s. net.

Pest Infestation

A STRIKING increase in the amount of work carried out by the Pest Infestation Laboratory for the Colonies is noted in a recent report.* Special investigations have been carried out on problems such as the susceptibility of paddy and rice to attack by mites and the underground storage of grain in pits.

Whether or not they can survive the winter in unheated buildings is a major factor affecting the prevalence and importance of pests in Britain. The ability to stand the cold varies from species to species and has to be specially determined for each one.

An investigation on the biology and behaviour of the khapra beetle has been started. Because of the ability of this beetle to thrive in very dry conditions, it has become one of the few serious pests in malt stores. A survey of the incidence and distribution of the insects has been made at maltings and work on feeding habits, rest periods, and so on is in progress in the laboratory.

The Laboratory is developing a quick electrical method for determining the moisture content of cereals, which promises to be much faster than any other method now in use. It takes about five seconds to test grain in sack or bulk. The device, needing neither battery nor a mains connexion, does not give as accurate results as most other methods but it is extremely simple, using electrodes pushed into the grain. Its simplicity and convenience give it advantages which compensate for its lack of precision. For example, it should be possible to test every sack of a consignment of grain as fast as it is delivered; it is even possible to compare the top, middle, and bottom of the same sack. The most obvious use for it would be in testing when buying grain, especially when the grain must not be damper than a certain level.

The study of the white deposit on brazil nuts, which reduces their market value, has been continued. Evidence obtained on ships bringing the nuts to Britain shows that development of the deposit is related to air movement. Whitened nuts were all distributed along air passages in the stowages. Whiteness does not develop if there is little ventilation or if there is plenty. There is no explanation at the moment for this curious result.

A large scale experiment on the air-tight storage of grain, using Atle wheat, is now in progress. It was harvested by combine at an average moisture content of over 20 per cent. and elevated without further cleaning into two 10 ton silage bins. The bins were filled almost completely and then sealed. Samples of the grain were sealed in cans, half immediately after harvest and half after drying to a moisture content of 14 per cent. These cans were stored in conditions as near as possible to those expected in the silo bins, and at intervals some were opened for examination.

The carbon dioxide concentration in the bins rose rapidly, the oxygen concentration being reduced to nothing after a few weeks. During the first few weeks there was an increase in internal pressure which was relieved by letting the air out at intervals. Within 15 days of sealing, the carbon dioxide concentration was more than 90 per cent.; when it reached 95 per cent. there was no further change or increase in pressure.

Further tests have been undertaken of the effectiveness of impregnating sacking with a mixture of pyrethrins and piperonyl butoxide. In two series of experiments, small impregnated "sacklets" containing cereals were exposed to attack by flour beetles. One set of sacklets was stored in the dark, and one set was exposed to sunlight or diffused daylight. The sacklets stored in the dark, without change of foodstuff, kept their insecticidal properties for about nine months. Those exposed to light had lost theirs in less than six months. Experiments on a larger scale, using 2 cwt. sacks, bore out these results.

At the request of the Ministry of Agriculture and Fisheries, a team has been investigating the control of the cacao moth in a "mixed" London warehouse. This insect has been responsible for an increasing number of infestations during the last few years. A comparison was made of different spraying techniques, one floor of the warehouse being devoted to each.

The results of the first season's work suggest that the officially recommended treatment is satisfactory for the protection of bagged goods against this insect. The treatment is, however, somewhat laborious and complicated. An alternative treatment using a portable machine, producing a dense mist of insecticide, appears likely to give equally good protection and is more convenient.

One of the special investigations reported in the Colonial Liaison Section was on filth contamination of maize meal, the staple food of Africans in many parts of Africa. The grain is attacked by insects and rodents at almost every stage. In many of the territories, the hammer mill has been introduced to provide maize meal, replacing the old method of winnowing the grain and grinding between stones or by pestle and mortar. In the hammer mill, the insects etc. are ground up with the maize. The meal produced is often said by Africans to be less appetising than that made by their womenfolk in the old way and they sometimes complain that it causes stomach upsets. Samples of the maize meal in East and Central Africa were analysed by several laboratories in Great Britain. The result showed that there were up to 22,000 insect fragments and up to 70 rodent hairs per 25 g. of meal.

* *Pest Infestation Research 1953*. Published by H.M.S.O. for D.S.I.R. Price 2s.

TO AUTHORS AND READERS

The publishers of FOOD MANUFACTURE invite the submission of manuscripts of books to be considered for publication. All manuscripts will be promptly acknowledged and carefully considered by qualified experts. A synopsis with chapter headings should be sent in the first instance, addressed to the Book Production Manager.

The publishers are specialists in industrial and scientific books and have a world-wide selling and distributing organisation.

Milk and Milk Products in India

FIFTY-FIVE papers were presented at a symposium on "Recent Advances in Biochemistry of Milk and Milk Products," held in Bangalore, India, during April, 1954, under the joint auspices of the Indian Dairy Science Association and the Society of Biological Chemists.

The chemical composition of the milk of cows, buffaloes, goats, and sheep and that of human milk has been studied, by analysing over 1,300 composite samples for different constituents. The composition of animal milk showed variations in the different regions as also in breeds. The estimations of phospholipids, biotin, pantothenic acid and folic acid in milk from different species of animals and in milk products has been carried out in detail. A systematic investigation of the choline content of milk in order to find out the relation between choline intake and the incidence of infantile cirrhosis has been undertaken. If the preliminary findings can be substantiated, it would make a valuable contribution to present knowledge. The amino acids in buffalo milk and the proteins of skimmed buffalo milk have also been investigated. The effect of different heat treatments of milk and of feeding iodinated casein on yield and composition of milk, and the preparation of a fortified composite protein food with milk casein as the base, are other lines of work engaging the attention of workers.

An electron microscopic investigation of the external morphology of some important lactic acid bacteria, including evidence for active stages of cell division, separation, and internal structure of bacteria, was also described.

In the analysis of milk and milk products, a rapid method has been evolved for distinguishing cow milk from buffalo milk by ultraviolet light, by which cow milk appears yellow owing to the presence of carotene. A rapid and accurate paper chromatographic method for the quantitative determination of lactose in milk has been developed (*Naturwissenschaften*, **40**, 343, 1953). Since lactose is the least variable among the major constituents of milk, the method can be used for detecting adulteration in milk.

In the section on the technology of milk and milk products, the problems of milk processing under tropical conditions were discussed in two papers presented by the A.P.V. Co. In India clarified butter (ghee) is widely used and studies have been conducted on the chemical analysis and the physicochemical factors involved in the washing of cream preparatory to its clarification. The preservation of milk sweets with antioxidants, gas packing, incorporation of mould inhibitors, such as sodium propionate, and the influence of factors as quality, heat treatment at 90°C., and addition of 2 per cent. salt on the deterioration of butter samples in cold storage have been elucidated.

The continued effects of feeding curds on the intestinal flora and biosynthesis of thiamine in rats (*Nature*, **171**, 608, 1953) clearly pointed out the influence of curds in synthesising thiamine, resisting the action of sulpha drug regarding the suppression of coliform organisms, and leaving a slightly persistent beneficial effect on the host for a short while.

In tests carried out on human subjects, curd feeding indicated a general improvement in the overall thiamine nutritional status of the subjects. The data were found to be statistically significant.

Filth Test for Flour

THE methods used and results obtained from filth tests on wheaten flour recently carried out in Belgium in accordance with that now generally prescribed in the United States have been described by G. P. Peeters of the Central Laboratories of the Belgian Ministry of Commerce (*Brot und Gebäck*, 1953, No. 6, June).

American regulations allow a choice between two methods of artificial digestion, using either pancreatic juice or hydrochloric acid. The first of these methods is somewhat costly in time and materials and has the further drawback that, in the course of the process, the flour becomes so light that it ascends to the water oil boundary, a number of filth particles thus being lost. The hydrochloric acid method, on the other hand, takes only a few minutes and requires no more than 17 ml. of hydrochloric acid for an effective segregation of the impurities. This latter method has therefore been adopted in Belgium.

The Wildman trap flask, originally used for this test, has been superseded by a new, specially developed separating funnel which permits the almost complete elimination of flour residue prior to the microscopic test.

For the same purpose, the Belgian laboratory has also developed another device, consisting of a tube, 4 cm. in diameter and 50 cm. in height, closed at the bottom with a glass filter funnel and, at the top, with a rubber stopper carrying an inverted funnel of a diameter equal to the inner diameter of the tube. Into the separating funnel, containing petroleum ether, air is pumped from above so that the ether is blown into the tube. The impurities are "wetted" and rise with the ether; at the same time, they are pushed upwards by the pressure. The ether now containing the impurities is siphoned off and tested microscopically.

The results obtained by this rapid method are at least as accurate as those obtained with the Wildman trap flask, but not quite so accurate as those obtained by using the specially designed separating funnel, which is therefore preferred.

These different methods have been used for testing samples of wheaten flour of Belgian and American origin to ascertain their contents of rodent hairs and insect particles. The samples of American origin were found to contain considerably fewer impurities than those of Belgian origin, showing that some improvements must be made in European methods if flour is to be adequately protected against insects and rodents.

Perforated dip tins containing grapes are loaded on to the dipping frame on the tractor for transport to the dip.

The Drying of Vine Fruits

F. Penman and **F. S. Oldham**

C.S.I.R.O. Research Station, Merbein — *Department of Agriculture, Wentworth, N.S.W.*

Vine fruits grown in Australia for drying purposes are sultanas, currants, and gordos (Muscat Gordo Blanco); in addition, small quantities of Waltham Cross grapes are dried as raisins. Sultanas account for about two-thirds of the Australian production of dried vine fruits. Of the remainder, currant production has so far considerably exceeded that of lexias.

THE stage of maturity at which grapes are picked for drying is most important. The maximum juice density of mature grapes of any particular sort varies from year to year by as much as 2° Baumé in sultanas, so that it is difficult to set a standard of sugar content to be reached before picking begins. A juice density of 11° Baumé should be aimed at, but as the drying season is short it is sometimes impracticable in seasons of low sugar content to wait for this. Picking may have to begin when only 10° is reached. On the other hand, in years of high sugar, 12° or more may be reached before harvesting commences.

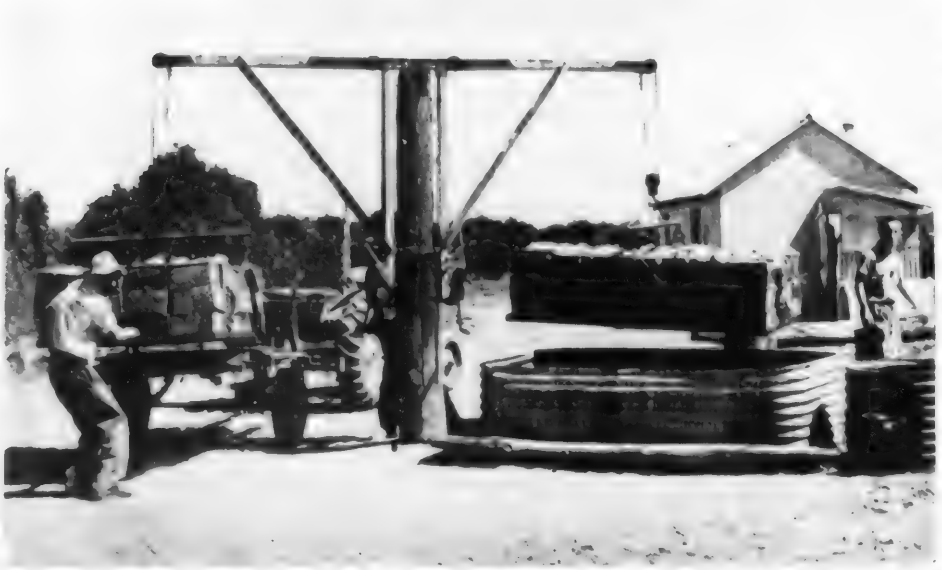
As a rule there is little good drying weather left after the completion of harvesting, so that in general it is not good practice to delay commencement much more than a week after normal starting time; in addition, better grades are usually produced in the earlier part of the harvest, drying is quicker, and handling costs are less. These advantages must be set off against a possible loss of tonnage if harvesting is commenced too soon.

Investigations at the Commonwealth Research Station, Merbein, have shown that 1° Baumé increase in the juice density of green sultanas can mean an increase of about 7 cwt. per acre in dried fruit production. Each grower has to make his own decision based on such factors as size of his crop, labour, rack space available, and the kind of grapes being grown.

For grapes grown under irrigation, it is essential that soil moisture content be maintained during picking and a pre-harvest watering is necessary. Irrigation delays maturity somewhat and it is often good policy to withhold water from a portion of the vineyard, thus permitting an earlier start on this portion of the farm. It is necessary to irrigate such areas immediately after picking.

Currants are generally picked first, but if no rain damage has occurred and sugar content of currants is still low at the usual harvest time, it sometimes pays growers, who have both varieties, to pick some of the sultanas first. If currants are not damaged, a better sample may be obtained by later picking, whereas early picking of sultanas often gives good grades. For mixed plantings, the usual sequence is to pick currants, then sultanas, finishing with gordos and Walthams.

Prepared at the request of the Dried Fruits Processing Committee, this report has been made available by the Committee to the Australian State Departments of Agriculture interested in dried vine fruits. It is concerned only with sun-drying methods, and has particular reference to irrigation areas. The Dried Fruits Processing Committee works under the aegis of C.S.I.R.O.



Bulk dipping of vine fruit, using double hoist. One set has drained over the dip tank after dipping and is about to be swung back to the tractor for transport to drying racks.

Drying of Sultanas

Three main methods are used for drying sultanas: the cold dip, the mixed dip, and the sulphite dip, the latter two being hot dips. By far the larger part of the sultana crop is now processed by the cold dip, because of its several advantages. In some of the Murray Valley settlements where the crop is a little late in maturing, hot dipping is considered more suitable. While the mixed dip is the one usually used in such districts, the sulphite dip, recently introduced by the Commonwealth Research Station, Merbein, is being used to increasing extent.

The relative merits of cold and hot dipping are:

1. Cold dip gives better grades than mixed dip with most types of fruit.
2. Sultanas treated with cold dip usually retain their colour a little better than similar fruit subjected to mixed dip.
3. Now that ready-prepared, stable, oil emulsions are procurable, cold dip is easy to prepare and use, and with the aid of multi-dips, large tonnages of fruit can be handled rapidly.
4. Cold dip materials are more costly than those for mixed dip, but the labour costs of dipping are less and the expense of heating the dip is avoided.
5. Cold dipped fruit requires more handling than mixed dipped fruit after removal from the rack.
6. The removal of green tinge from certain types of cold dipped fruit is somewhat difficult.
7. There are certain difficulties in using the mixed dip, and it is less suitable than cold dip for the rapid handling of large crops. It does, however, give good results in the hands of an expert.

The Cold Dip

Perforated buckets of fruit are loaded on to a steel frame on a cart in the vineyard and the whole load is lifted off either by windlass or block and tackle and lowered into the dip tank. When the load is hoisted out it is allowed to drain, replaced on the cart, and taken to the rack for spreading.

For smaller quantities, a useful plant consists of a tank with two movable platforms connected in such a way that when one platform is raised the other is lowered into the tank. Twelve buckets can be placed on each platform, and while one lot is in the dip the other 12 are draining. When drained, they are replaced by fresh fruit, which is then lowered into the tank. This outfit can be placed on a sledge or low truck and pulled along as rack filling proceeds; in this way, the fruit is lifted from the dip straight to the rack.

Preparing the Dip

The cold dip consists of a solution of potassium carbonate to which has been added some emulsified dipping oil, usually with a wetting agent. Packing houses and private firms have prepared suitable emulsions, which are readily obtainable on the market. Satisfactory results are usually obtainable if the maker's instructions are followed carefully in preparing the dips.

The tank is filled to the desired level with water and carbonate of potash is added at the rate of 1 lb. to 4 gal. of water. This is added slowly, with constant stirring. The correct amount of dipping oil is added, according to the maker's direction. It is not desirable to recommend a particular commercial dipping oil, because manufacturers are continually improving their products, and what may be the best in one season may be outclassed by another the next season. The Commonwealth Research Station, C.S.I.R.O., Merbein, Victoria, has the matter under constant review and information on the characteristics of various dipping oils is made available periodically to the industry.

As the level of the liquid in the tank falls, it is maintained by adding stock liquid. If necessary, its alkalinity is adjusted by adding caustic potash until thymolphthalein test paper dipped into the well-stirred liquid changes to an intermediate blue colour.

Dipping the Fruit

The fruit is immersed in the dip until the grapes are wetted all over and appear translucent. A few small white spots may be present on the fruit; these are due to air bubbles, and may be disregarded. The time of immersion depends on a number of factors, a typical time being 30 seconds. The fruit must not be under-dipped, but no harm is done if it is allowed to remain in the dip for considerably longer periods than is necessary to wet it completely.

After immersion in the dip, the fruit is drained and spread on the racks. Careful handling from vine to rack is essential, as damaged berries deteriorate on drying, giving an inferior grade of product, and are apt to mould. Crushing berries by overfilling the buckets is a common cause of damage, and crushed berries also cause alterations in the strength of the dip solution.

Spreading and Drying

It is recommended that racks should be filled from the top downwards to allow all loose berries to fall through to the bottom tier. A hessian is placed on the bottom tier to collect them, and no other fruit is placed on this tier. The reason is that loose berries always yield a poorer quality than the rest, and it is desirable for these to be segregated. If racks are filled from the bottom upwards, most of the loose berries are caught and held by the other fruit.

Thin, even spreading is necessary for quick and satisfactory drying. On a 4 ft. rack, 12 to 14 buckets are sufficient to fill each tier in a 10 ft. panel. Thicker spreading delays drying and encourages mould in bad drying weather. As they come under notice, bunches with broken or wasted berries, or mould, should be picked out for drying separately. A spreading tray is recommended, as fruit can be evenly spread without having to be moved after placing on the rack, thereby minimising the number of loose berries.

A suitable tray is made of galvanised iron about 23 in. × 19 in. × 3 in. deep, with one side removed. The fruit is tipped on the tray and spread evenly. The tray is then put on the rack where the fruit is to be placed. The back end of the tray is slightly raised and jerked backwards so that the fruit falls in position and does not have to be moved again. Another advantage is that racks may be filled from one side. Filling from the top downward can be done only when racks are in good order and tiers are well strained. After filling the top tier, several panels of it must be raised about 8 in. in order to have sufficient room to fill the next tier. This can be done by lifting the tier and propping it up with pieces of wood of the right length, placed near the rack posts.

Fruit should be protected from the sun by side curtains for the first day or two after dipping, and later during very hot weather, especially on the western side of the rack, as colour is apt to suffer by sunburning. Protection from rain should be provided at all times, as wetting of fruit delays drying, reduces grades, and encourages mould.

Spraying of the fruit on the drying rack may be carried out to assist drying in poor weather. Spraying causes a deeper colour in the fruit, therefore fruit on racks should not be sprayed if good weather prevails. Under continuously poor conditions, dip containing double the usual amount of carbonate of potash should be used as a spray.

Removal from Rack

Fruit must be left on the rack until quite dry. The few berries which dry out more slowly than the bulk of the fruit should be allowed to dry before the fruit is disturbed. Fruit should separate readily from the bunches when lightly rubbed with the fingers, and should shake down easily. If taken off too early, a definite deterioration in colour and value occurs. Rack-dry fruit should be shaken down and not rubbed off with sticks or hoe handles, as this crushes berries and stickiness results. Fruit should be spread on hessians as soon as possible after shaking down, as loss of colour occurs if it is left in heaps before it is completely dry.

Fruit should be spread evenly and thinly on hessians and exposed to the sun until it is completely dry, one or two days of hot weather usually being sufficient. If a green tinge persists in the fruit, it may be sprayed with water in the morning.

Sisalkraft has proved useful on the drying ground. A sheet laid on the ground under the hessian prevents moisture rising out of the ground and also holds heat from the sun, thereby hastening drying. If rain threatens or nights are dewy, fruit is rolled into the centre of the hessian, and the sides of the hessian doubled over the top. Sisalkraft folded over in the same manner helps in protecting the fruit. Fruit should be spread out again in the morning or as soon as the weather clears. When drying is completed the fruit is placed in sweat boxes and sent to packing houses for processing.

The Mixed Dip

The plant generally used for the mixed dip is a 75 gal. galvanised iron tank, beneath which provision is made for wood fuel heating, two to four flues passing from the rear of the fire box through the dip into a common exhaust flue at the stoking end. Usually, one bucket of fruit is dipped at a time, but devices for dipping two buckets at a time are used by some growers.

Preparing the Dip

The tank is filled with water, and for each 75 gal. 3¾ lb. carbonate of potash and 2¼ pints dipping oil are added and the whole stirred.

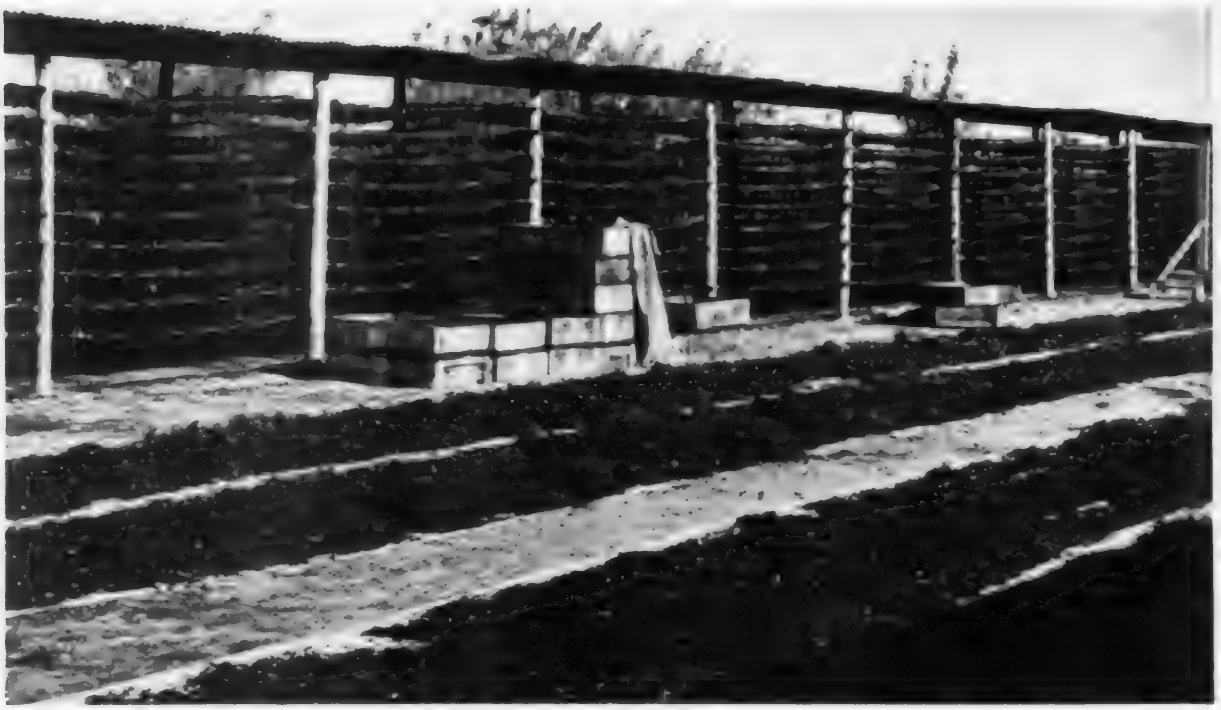
The mixture is heated to 180°F. and 2¼ lb. caustic soda is added for each 75 gal. If the fruit does not crack satisfactorily when dipped in a sample bucket, more caustic soda should be added, about ¼ lb. at a time, until it does so. Within a few minutes of dipping, a number of small cracks should appear on some of the berries.

The temperature should be maintained at 180°F. during dipping, and the dip should not be heated to higher temperatures when not in use. The appearance of the fruit should at all times be taken as a guide to the concentration of caustic soda. If overcracking occurs, the concentration of caustic soda should be decreased. In the Swan Hill district of Victoria, the fruit is usually cracked more heavily, a temperature of 185°F. being used. The use of four pints of Syntholene (commercial ethyl oleate) to replace the 2¼ pints of dipping oil has given good drying results in this district.

Dipping, Spreading, Spraying, and Drying

In contrast to the cold dip, the fruit should be immersed with a sweeping motion for one or two seconds only, allowed to drain, and promptly spread on the rack. Delay with hot-dipped fruit causes darkening in colour and therefore a lower grade of dried fruit. If the fruit on the racks becomes wet with rain, or if bad drying conditions persist for some time, the following mixture should be sprayed on it as soon as there is a dry morning:

Caustic potash	6 lb.
Sodium sulphite	5 lb.
Dipping oil	1 pt.
Water	25 gal.



The fruit is dried on the racks, the operation being completed on hessians.

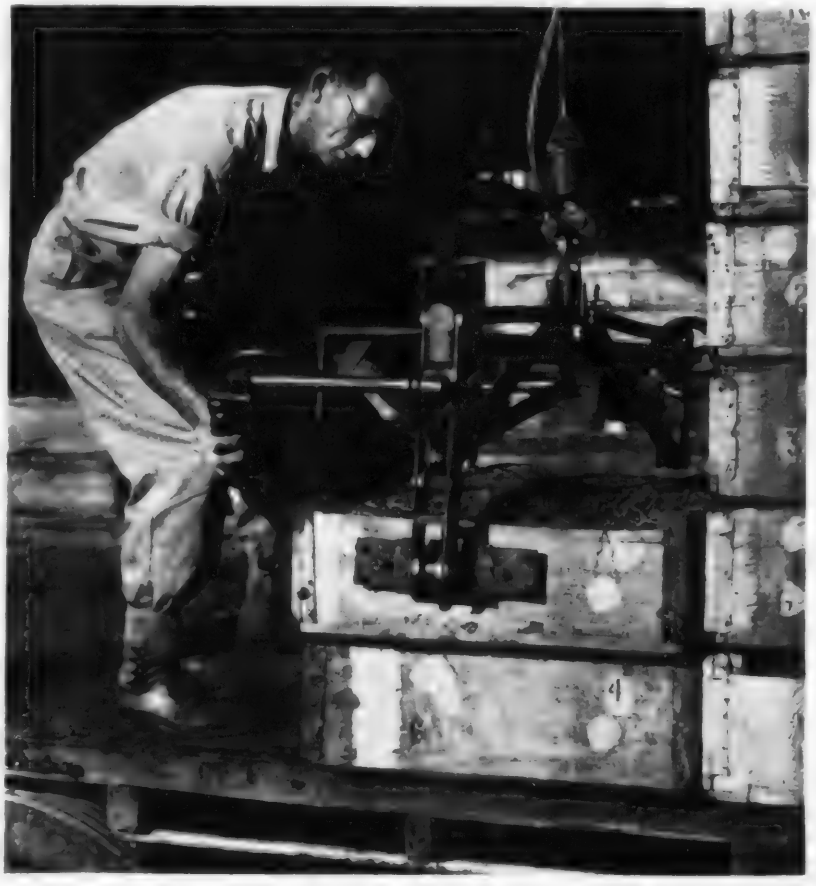
This mixture can be used at half strength if weather conditions have not been very adverse, but it is important that spraying should not be done when the fruit is wet or when rain is falling. Cold-dip mixture may be used instead of the above mixture. After hot dipping and drying on the racks, the fruit is handled as for cold-dipped fruit, except that a shorter period of exposure of the fruit to the sun usually will suffice, and there is no need for treatment for removal of green tinge, which is absent from hot-dipped sultanas.

The Sulphite Dip

The advantage of the sulphite dip over the mixed dip is that it yields fruit of a somewhat lighter and more uniform colour. It also discourages mould growth, fermentation, and vinegar flies in bad seasons. Higher temperatures and more severe cracking do not cause as much darkening as with the mixed dip. Because of the additional degree of protection during drying offered by the sulphite dip, growers might be prepared to consider later harvesting than they feel they could adopt with the mixed dip.

The plant is the same as that used for the mixed dip. The tank is filled with water and for each 75 gal. are added 15 lb. of sodium sulphite and 2¼ pints of dipping oil. The whole is stirred well and heated to 180°—190°F.

When the dip reaches this tem-



Dried fruit, transported in "sweat boxes," being unloaded at the packing house door.

perature, 3 lb. of caustic potash is added, and tested for cracking. There are limitations on the kind of dipping oil which can be used in the sulphite dip, because a precipitate is thrown down with certain oils. Peanut and cottonseed oils and "Mobil Special Fruit Dipping Oil" have been found suitable.

The dipping, spreading, spraying, and drying are the same as for the mixed dip. Hot dips should be changed after each day's dipping or, if the fruit is in good condition, after 2,000 to 3,000 dip tins of fruit have been put through the standard 75 gal. mixture.

Drying of Currants and Gordos

The juice density of currants should be relatively high before the grapes are picked and if possible should be 13½° Baumé at the beginning of harvest. On many vineyards, however, this maturity is not reached when picking must be commenced. When the maximum practicable maturity is reached, the currants are picked and placed on the racks without being treated in any way. Thin, even spreading is essential for quick drying and the use of a spreading tray is recommended. As filling of the rack progresses, side curtains should be let down, shade dried currants being superior to those exposed to the sun. In wet weather, curtains should be raised immediately after the rain to permit rapid drying of the surface of the fruit, and thus make the fruit less liable to develop mould. Every effort should be made to prevent the fruit from being wetted during rain.

The fruit should remain on the rack until almost dry enough to box. Some of the seeded berries will not be completely dry, but they should be dry enough not to cause stickiness in handling the fruit on the hessians. It is then shaken down and spread thinly on hessian. It is exposed to the sun for several days and should be rolled into heaps in the evening while the fruit is still a little warm and spread out again in the morning. When quite dry, the fruit is put into sweat boxes and delivered to the packing house.

Gordos should be dried by a plain caustic dip. This gives a raisin with a tough skin which is very desirable when the fruit is put through the de-seeding process.

The Plain Caustic Dip

The dip is made by adding 2 lb. caustic soda per 50 gal. of water and heating to 200°F. Extra caustic is added to the dip in ¼ lb. lots until the grapes crack sufficiently as described for the hot dip sultana process. An alternative is to maintain the dip at boiling point; for this practice, less caustic soda is needed and the dip is made up with 1½ lb. per 50 gal. of water. Extra caustic is then added to give the cracking desired. This alternative method gives a darker coloured product.

The fruit is dipped, drained, and spread on the racks in a manner similar to that used for sultanas. When ready to remove from the rack, it is shaken down and spread on hessian and allowed to dry thoroughly.

Gordos can be dried by the mixed dip process, but the process is not recommended as potash softens the skin of the raisins. If the mixed dip is used, it is prepared in a similar manner to the mixed dip for sultanas. Gordos should not be dried by the cold dip. They will dry by this method, but an inferior soft-skinned product is the result.

Waltham Cross make good raisins and should be treated in a similar manner to Gordos. Slightly lower caustic soda concentrations are usually found to give satisfactory cracking of the berries.

Drying of Table Raisins

Gordos and Walthams are both satisfactorily used for the production of table raisins used for this purpose and both make good table raisins.

Sun drying of table raisins is a long and tedious process, involving considerable labour in stacking and unstacking trays if weather is unfavourable.

Table raisins are now dehydrated in packing houses, so that there is little scope for sun drying by growers. Unless already experienced, growers are advised to try the procedure outlined below with small quantities only.

Nothing but the best fruit should be used and it should be left on the vines until quite mature. Bunches should be trimmed to remove small or damaged berries and placed on wooden trays, 4 ft. × 3 ft. The fruit is packed closely without placing bunches two deep, with about 50 lb. of fruit per tray. Close packing ensures compact bunches when dry.

Trays are placed in the open. If nights are dewy or rain occurs, trays must be stacked until conditions permit the fruit to be exposed again. In seven to 14 days, according to how drying is progressing, the trays are turned by placing an empty tray on top of a full one and quickly turning the two trays together. The fruit must be left on the trays until thoroughly dry.

Small Electric Motors

PRACTICAL guidance to the maintenance and overhaul of electric motors up to 1 h.p., covering the standard motors used in industry and in the home, is given in a recent book.* Each component of the motor is dealt with, and the usual faults met with and their repair are discussed.

Theory and major repairs have been deliberately ignored; these, together with actual rewinding, are matters for the specialist and have no place in a book which treats a rather complex subject as simply as possible.

A useful feature of this book, which has been compiled for the maintenance man, the fitter, and all users of motors, is an illustrated dictionary of connexions in common use.

* *The Repair of the Small Electric Motor.* By Karl Wilkinson, M.A.E.T. Pp. 180 + xii. Spon. Price 20s.

FUTURE ARTICLES

AMONG the articles to be published in forthcoming issues of FOOD MANUFACTURE are the following: "The Higher Alkyl Gallates," "The Lobster," Part I, "Mushroom Growing on Trays," "Real Farmhouse Cheese," "Processed Foods," and "The Drying of Sugar Beet Shreds."

Ice Cream Stabilisers

R. W. Moncrieff, B.Sc., F.R.I.C.

Several stabilisers are used in the ice cream industry, those that are used on the widest scale being gelatin, locust bean gum, and the alginates. All three have their special features, and the author's experience with stabilisers leads him to think that more can be done with them than is commonly known.

ALL ice cream stabilisers, whether gelatin, modified locust bean gum, alginate, or other substance, are colloids possessing powerful hydrophilic properties. The molecules of the stabiliser are polymeric; they consist of very long molecules, which often may be several thousand times as long as they are broad, and very much longer than the molecules of any of the other constituents of the ice cream mix. They weave their way in and out of the fat, casein, sugar, and water molecules. All along the length of a single stabiliser molecule, hundreds of water molecules clustering on to it are immobilised; instead of being able to move among other molecules and to oscillate freely, they are held firm. The whole structure of the ice cream mix becomes less fluid, thicker, and more solid (Fig. 1 and 2).

Resistance to Heat

The first function of the stabiliser is to mould the mix of fat, sugar, and water into a whole, and to make it less fluid and more cohesive, so that the finished ice cream will not melt as soon as it is taken out of the refrigerator or ice box. Without a stabiliser it would do so, especially if exposed in a warm room.

Melting is caused by a sudden increase in the freedom and amplitude of movement of the constituent molecules; if there are long stabiliser molecules threading in and out among hundreds of other molecules, and each holding to itself hundreds of other molecules, and if the whole mix is honeycombed with these straggling stabiliser molecules, the freedom of movement of all the other molecules is greatly reduced and it is accordingly much more difficult for the mix to melt. In fact, a stabilised mix melts much more slowly, which is exactly what is required.

Thus, it follows that the greater the length of the molecules of stabiliser and, up to a point, the more there are of them, the more slowly will the mix melt, and that ice cream which has a long-delayed melt can be made by using a stabiliser which has exceptionally long molecules. Such a stabiliser is called a high polymer; a high "Bloom" gelatin is a high polymer; so is a high "grade" alginate.

The comparison of a 1 per cent. aqueous solution of a high grade stabiliser with a similar solution of an ordinary one will show that the former is much thicker. This is a reliable test easily carried out by the ice cream manufacturer.

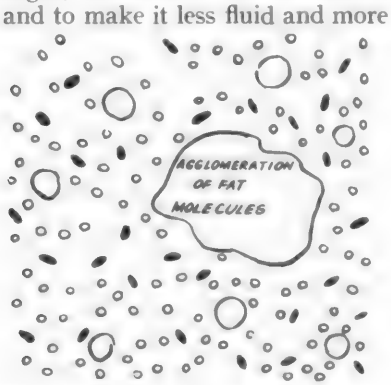


Fig. 1.

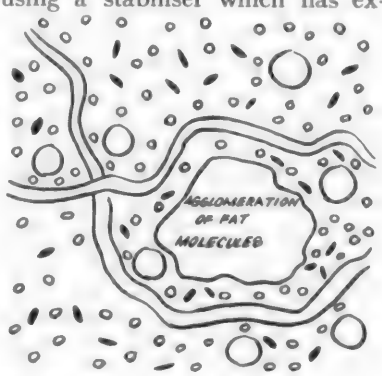


Fig. 2.

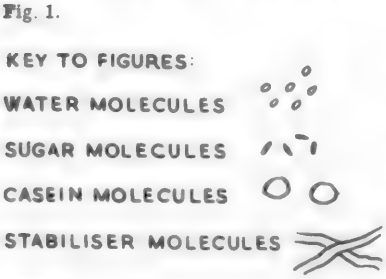


Fig. 1. Molecular picture of an unstabilised ice cream mix. All the molecules are free to move without hindrance, if the temperature is above the freezing point. When taken out of a cold box such a mix would melt far too rapidly.

Fig. 2. Molecular picture of a stabilised ice cream mix. The long straggling stabiliser molecules inhibit, even above the freezing point, the movement of most of the other molecules. These can move only with difficulty and the mix melts slowly.

Freedom from Crystallinity

If crystals are allowed to form in an ice cream, its texture is impaired. It is one of the functions of a stabiliser to prevent ice formation in the mix, or at least to ensure that the crystals that inevitably will form are so small that they cannot be detected on the tongue or against the palate. Crystallisation is a simple process molecularly; it consists only of the molecules of one kind of substance (water in the present consideration) arranging themselves in an orderly way. The molecules of water at low temperatures have a natural aptitude for falling into a regular formation, thus:

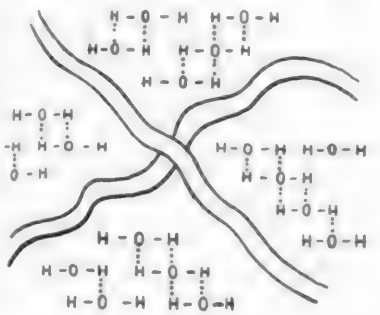
H–O–H H–O–H H–O–
–H H–O–H H–O–H H–
–O–H H–O–H H–O–H
H–O–H H–O–H H–O–
–H H–O–H H–O–H H–

and when this happens, "hydrogen bonding" takes place, as shown below by the dotted bonds:

H–O–H H–O–H H–O–
–H H–O–H H–O–H H–
–O–H H–O–H H–O–H
H–O–H H–O–H H–O–
–H H–O–H H–O–H H–

Instead of the water (H–O–H) molecules being free to move hither and thither, and free to oscillate, they are fairly firmly fixed, and the water turns to ice.

If, however, there are long stabiliser molecules straggling among the countless water molecules, they hinder the orderly falling into line of the water molecules, they inhibit freezing and such orderly arrangements of the water, and such molecules as can form in the spaces between the stabiliser molecules are only very small indeed, as shown.



Prevention of Separation

In the United Kingdom it is usual to add about 1 oz. per gallon of an emulsifier, usually G.M.S. (glyceryl monostearate), to the mix to prevent its separation into aqueous and fatty layers. Even when this separation does take place, it is only partial and often it consists simply of the separation of a small aqueous layer at the bottom of the mix. Nevertheless it is objectionable and is particularly liable to happen when the mix is made and kept for some considerable time before it is frozen.

The nature of the stabiliser which is included in the ice cream mix may well be decisive in this respect. If a stabiliser can be used which has both hydrophilic (water-loving) and lipophilic (fat-loving) groups in its constitution, it will undoubtedly help to prevent separation of the mix. This it will do because one and the same stabiliser molecule will attract to itself not only large numbers of water molecules but also large numbers of fat molecules, thus both water molecules and fat molecules are attracted to and find lodgment on a single stabiliser molecule.

How could the mixing of fat and water be more intimate than for both to be tied to the same (stabiliser) molecules?

When blocks of different ice creams are put on plates and allowed to melt, it will be found that some will be converted to a uniform cream, while others will melt unevenly, with the separation of an aqueous whey. It is, however, in the author's view very doubtful indeed if much importance should be attached to the nature of the very slow melting that occurs perhaps over a period of several hours; some popular ice creams show a certain amount of wheying off in this test. The manufacturer whose product does not do this may frown at them, but the public like them.

What does matter is the creaminess of the melt in the mouth, *i.e.* when melting takes place in a matter of seconds. An ice cream which has had no stabiliser incorporated in it will melt very rapidly and will be far too cold against the palate, and can be quite painful to eat. A well-stabilised ice cream will, however, become more creamy as it partially liquefies in the mouth. Once again there may be advantage in using a high grade of stabiliser, because when this is done the melt is naturally thicker and more viscous. It is quite possible to detect the extra creaminess in the mouth which such a stabiliser will give, compared with ordinarily good ice cream made with an average one.

Retention of Shape

Retention of shape is desirable; if ice cream is sold as blocks (particularly if chocolate-coated), the longer these will keep their sharp edges and corners the better. This property is very closely tied to that of slow melt-down, but it is by no means identical with it. Some ice creams will retain their shape for a long time and then collapse quite suddenly as a whole, others droop at the edges and corners very quickly but may in the end outlast the first class. Shape retention is apparently due to the formation of a weak jelly structure in the ice cream. There seems to be nothing against this, indeed it may make the product more attractive. Clearly those stabilisers which, apart from their use in ice cream, are commonly used for jellies will be most likely to give good results in this respect.

The stabiliser should be odourless and tasteless and should betray no sign in these respects of its origin.

Some manufacturers are inclined to make rather a mystery about ice cream stabilisers. There is no doubt at all that an ice cream mix can be a very complex system, but the principles which underlie the action of a stabiliser are simple enough.

Fluorescence Analysis

THE fact that a volume has reached its fourth edition is fairly sound proof of its usefulness to those for which it was first written. As the authors remark in their preface to the new edition,* the long interval which has elapsed since the publication of the third one (July, 1939) has been due to war circumstances. During that interval an enormous number of contributions have been made to the science of fluorescence analysis, and it has been possible after so long a period to cut out much of the dead wood rendered obsolete since the first edition was published in 1933.

The change which has taken place between the third and fourth editions can be realised by turning to the end of each chapter where the additional references follow those which dealt with the citations of the third edition. In many cases the additional references are numerically at least equal to those previously cited, with the net result that this volume may be considered a survey of practically twice as much material as was covered by the former edition.

As previously, the volume is divided into two sections, the first part dealing with the theory and technique of fluorescence analysis, and the second with its applications. In essentials, Part I is a 100 page introduction to the whole of the second part in which the main concern is with the technique of producing, using, and measuring ultra-violet light. In previous

* *Fluorescence Analysis in Ultra-violet Light*. By J. A. Radley, M.Sc., F.R.I.C., and Julius Grant, M.Sc., Ph.D., F.R.I.C. 4th Edition (revised). Pp. 560 + xvi. Chapman and Hall. Price 52s. 6d.

editions, this section of the volume was always of considerable value to those taking up the subject, and to those who needed a reference work dealing with fluorescence methods outside the scope of their previous experience. It still serves this very excellent purpose.

In the second part, the applications of fluorescence methods to a whole series of specialised subjects are considered, including agriculture, bacteriology, botany, constructional materials, foods and drugs, fuels, lubricants, and inorganic materials with which is also incorporated a section on minerals and gems. A special section is devoted to organic chemicals, paints, varnishes, paper, cellulose, rubber, and textiles. Specialised chapters also deal with the application of the subject to leather, medico-legal and criminological work, and to the water, sewage, and dyestuffs industries. As previously, a considerable number of excellent photographs illustrate the volume and are collected together in an appendix at the end.

All these sections are very ably handled, each constituting a well-documented monograph. Naturally, in the selection of material for a volume such as this no two writers would agree on what to put in and what to leave out. I am, however, surprised at there being no section devoted to the fluorescence analysis of plastics or to materials used in detergents for producing a fluorescent effect on fabrics and so enhancing their whiteness during laundering.

Personally, I find the system of additional references to be somewhat confusing. While the reference from text to the bibliography is perfectly clear when the numbers of the previous edition are used, there seems no way either of proceeding from the text to the additional references which are not arranged in alphabetical order, nor from these references back to the text. In the section on food products, if it is desired to make a rapid reference from the additional references such as Braunsdorf and Reidermeister's work on the use of fluorescence analysis in determining the age of eggs, it is extremely difficult to find this information in the reference list and there appears to be no connexion between the text on pages 200 and 202 which deal with this subject and the reference in the list. This makes the transition from the volume to the original literature very difficult. This is a general factor and not just an isolated example, and in my view diminishes the value of what is admittedly a very useful and informative work.

Taking another example, references to the literature on the estimation of nitronaphthalene by fluorescence analysis do not appear in the index as nitronaphthalene nor is there any reference to it in the chapter on organic chemistry, but a detailed search through the additional references brings to light the well-known paper of English and Eppert on this subject which is cited and not commented upon.

It may be a form of ingratitude to suggest how much more valuable this work would have been had these various additional masses of information been provided with signposts, either from the text or from the index. Another blemish on this otherwise excellent work is the poor index. I took, at random, seven organic substances, namely, lavender, oil of; coumarin; rhodinal; cinnamic alcohol; methyl salicylate; naphthacene; and umbelliferone. All these are mentioned in the text and none of them appears in the index. Close inspection shows that it has been compiled by listing only topics and not substances, although this principle has been departed from in certain cases; the net result is that anyone wishing to look up the fluorescence data concerning a specific substance stands only a one in seven chance of finding a route from the index to the text.

In general, this fourth edition may be welcomed as a valuable laboratory standby for the solution of many interesting problems. The authors are to be congratulated on their work and encouraged to do even better by making a really comprehensive survey in their fifth edition.—G. M. D.

Identification of Fungi

An attractively produced book,* consisting principally of line sketches showing the characteristic features of 109 common genera of fungi, contains in addition some well-illustrated notes on fungal structure, with an account of the principles of classification of the fungi, and an eight-page summary of laboratory technique.

The sketches of genera are in three groups: fungi of general interest (including common moulds); fungi of medical interest; and fungi causing plant diseases. The second of these sections has a useful diagnostic key to the fungi causing human mycoses.

The sub-title of the book is perhaps slightly misleading. The field covered is better described in the opening sentence of the preface as "an introduction to mycology for beginners." Within these limits, the book gives a clear introduction to fungal classification. The style is at times rather naïve, *e.g.* "A very simple and expeditious method of ascertaining the presence or absence of a fungus in diseased tissue is to examine a representative portion of it under the microscope" (p. 30).

The beginner may receive the impression that the identification of an unknown fungus is a comparatively easy matter. This will serve to encourage beginners lacking in confidence; the others may be reminded that there are about 5,000 genera of fungi, with ten times as many species, and that identification is frequently difficult and tedious, if not impossible.

The book can be recommended to beginners, particularly those with a good visual memory for diagrammatic illustrations, which with some people register more readily than photomicrographs. They will find it helpful in recognising the commoner fungi, and further experience will give them a fuller idea of the vast range of organisms included in the fungal classification as set out.

A useful feature of the book is a glossary (9 pp.) of terms used in mycology.—L. D. G.

* *Practical Mycology—A Manual for Identification of Fungi.* By Sigurd Funder, Ph.D. Pp. 145. A. W. Broggers Boktrykkeri. Price 39s.

Standards for Quick Frozen Foods

A Committee appointed in February, 1952, to consider and make recommendations as to the promotion of measures relating to the maintenance of standards of quality in respect of the preparation, freezing, packing, storage, transport, and handling of quick frozen foods has now published its report, in which have been made recommendations for voluntary standards of quality for quick frozen fruits and vegetables, poultry, game and rabbits, and pre-cooked foods, but no work has been undertaken in connexion with quick frozen fish because this is to be dealt with by the White Fish Authority.

THE recommendations made by the Committee are set out below. So far as the recommendation on pre-cooked foods is concerned, there was a division of opinion on the definition of quick freezing and the temperature recommendations for storage.

Fruit and Vegetables

Quick freezing in relation to fruit and vegetables means fruit and vegetables which are frozen by a process which reduces the temperature of the whole of the fruit and vegetables from 32°F. to a temperature of 23°F. or lower in a period of not more than two hours, the cooling process continuing until the temperature has been reduced to 0°F. or below.

Fruit and vegetables which have not been so frozen shall not be described or offered for sale as "quick frozen."

Fruit and vegetables for quick freezing should, in general, be of such quality as could reasonably be expected after defrosting to provide good wholesome food.

Full details are given in the report of the standards for grades of quick frozen strawberries, raspberries, beans, and peas.

Poultry, Game, and Rabbits

Quick freezing in relation to uncooked poultry, game, and rabbits means poultry, game, and rabbits frozen by a process which reduces the whole, or the most solid part of the carcass, from 32°F. to a temperature of 23°F. or lower in a period of not more than two hours, the cooling process continuing until the temperature has been reduced to 0°F. or below.

Poultry, game, and rabbits which have not been so frozen shall not be described or offered for sale as "quick frozen."

The quality standard of the poultry shall be based on the recommended grades and definitions as set out in the Ministry of Agriculture and Fisheries Marketing Guide—No. 41—published (revised) October, 1951, and the eventual outturn of the quick frozen product shall conform to the same recommended grades.

The standard for game and rabbits for freezing shall not be less than that required for the retail trade. In the case of game, it shall be left to the processor to satisfy the wishes of his customers for any specialist standard; in order to prevent the substitution of one variety of game for another, the feet of the game shall be left in order to provide means of identification.

Provided the raw material conforms to standard, the type of packaging used is a matter for the individual processor as far as the catering and allied trades are concerned, but for the retail trade it may be possible for a certain amount of uniformity to take place, not only as far as packaging but also as far as identification of grades is concerned.

As far as the killing of poultry and its natural preparation is concerned, it is not desirable to lay down particular methods, but the best possible practices shall be employed at all times by individual processing firms. Killing, whether it includes bleeding or not, shall be done in a proper humane manner so as to cause no unnecessary suffering to the bird or animal which is being killed.

The highest possible standard of hygiene shall be maintained and water used shall be clean, potable, and free from contamination. It is recognised that a good water supply from the main source is not available to all firms. In the circumstances, the use of chlorinated water is permissible provided the strength of chlorination is adequately controlled.

All bins in use for the reception of waste material shall be covered; this waste shall be removed from the working site at frequent intervals before it becomes noisome. All plant, utensils, and blocks shall be kept clean.

It is appreciated that considerable harm can be done by airborne pests such as flies, and all practical means shall be taken to prevent, as far as possible, any such contamination of plant and product.

As a high standard of personal hygiene of operatives is essential, washing facilities shall be provided on the site of preparation to ensure that operatives have the facilities for maintaining their hands in such a state of cleanliness as to provide a minimum of contamination of the raw material while being handled; in the case of those operators who have cut hands or sores, they shall not be permitted to handle the raw material.

All quick freezing plant operating on poultry shall be licensed by an authority agreeable to the trade.

Pre-cooked Foods

Quick freezing in relation to pre-cooked quick frozen foods means pre-cooked foods which are frozen by a process which reduces the temperature of the food from 32°F. to a temperature of 25°F. or lower in a period of not more than two hours, and the freezing process should be continued until the whole of the product is at the storage temperature of 0°F. The whole of the freezing cycle should be completed within four hours.

Where fish, fruit, and vegetables or poultry, game, and rabbits form a predominant ingredient of a quick frozen pre-cooked food,

such quick frozen pre-cooked food shall not be described as "quick frozen" if it has not been processed in accordance with the above terms.

It is desirable to emphasise that the quick freezing process should be clearly distinguished from the sharp and slow freezing methods. This is particularly important in the case of frozen pre-cooked foods because of the danger of the trade being brought into disrepute in consequence of so-called pre-cooked quick frozen foods produced with faulty methods, including methods involving unsuitable temperatures.

Consultation has taken place with the Scientific Adviser's Division of the Ministry of Food about the definition which could properly apply to "quick frozen" in relation to pre-cooked quick frozen foods. As a result of these deliberations, attention is drawn particularly to the following important principles:

(*a*) The time between cooking and freezing should be a minimum.
(*b*) Every care should be taken during that time to avoid contamination of the cooked food.

In view of the danger of rapid bacteriological development in pre-cooked foods between the temperatures of 140° and 60°F., freezing of pre-cooked quick frozen foods should start not later than two hours after the temperature of the food has fallen to 140°F. This suggested maximum holding time need be applied only to those foods or ingredients where significant microbial multiplication is possible prior to freezing. It is necessary to allow freedom of action for some foods, such as pastry, mayonnaise, food pulps, and canned foods. It is considered, however, that the prompt handling of more vulnerable items, such as meat, fish, egg products, and creams, is more essential than, say, pastry items.

All raw materials used in the preparation of pre-cooked quick frozen foods shall be sound, wholesome, free from blemish, and of the finest quality. They shall be of the nature and quality described and comply with the provisions of the Food and Drugs Act and all other statutory regulations and requirements relating to food sales.

Factory Hygiene

The closest attention shall be given to hygiene in factories and every effort shall be made to maintain a very high standard. Particular attention shall be given to the equipment used, and precautions shall be taken to ensure that all staff observe a high personal standard of hygiene.

Attention is drawn to the following four hazards:

(*a*) The growth of bacteria and the production of heat-resistant toxins in the prepared and uncooked foods.
(*b*) The heat-resistant organism which may survive cooking and subsequently multiply in the cooked food given suitable conditions.
(*c*) The contamination of the cooked foodstuff before freezing.
(*d*) The conduct of the purchaser with regard to storage.

It is recommended that manufacturers should deal with (*a*), (*b*), and (*c*) by minimum times of storage at points (*a*) and (*c*).

It is not considered necessary to give views on factory hygiene in greater detail, since it has been dealt with at some length in the recommendations of the Meat Hygiene Committee of the Food Manufacturers' Federation, which have been published in a booklet entitled "Hygiene in Meat Products Factories."

The recommendations there made are applicable to all types of food factories. With the exception of the recommendation on storage and treatment in manufacture, they would certainly be applicable to factories which prepare frozen pre-cooked foods involving the use of meat.

There is a great deal of legislation concerning foodstuffs and factories and perhaps it will be useful to draw attention to some of the more important Acts and Regulations; these are as follows:

1. The Food and Drugs Act, 1938.
2. The Factories Acts, 1937-1948.
3. The Public Health (Preservatives, etc., in Food) Regulations, 1925-1948.
4. The Public Health (Infectious Diseases) Regulations, 1927.

Packaging Pre-cooked Foods

It has been noted that pre-cooked foods have been excluded from the British Standards Schedule No. 1874 of 1952, Packages for Frozen Foods. Owing to the nature and complexity of the quick frozen cooked foods business, no useful purpose will be served in attempting to standardise the size and types. Indeed, it is felt that it would be impracticable to do so.

All pre-cooked quick frozen foods supplied for sale by retail shall be wrapped in a suitable hygienic wrapper, as it is considered to be particularly important that such goods shall be protected as far as is reasonably practicable from contamination prior to actual sale to the consumer.

The problem of damage to foodstuffs and contamination of foodstuffs before they reach the consumer is common to all the food trades, but frozen pre-cooked foods are subject to an additional risk in that the goods are spoiled if the proper temperature is not maintained at all times. It is most important, therefore, that particular attention be paid to the choice of outer containers and to the packing, so as to maintain a suitable temperature and to ensure that the goods will normally arrive at the retailer's premises in satisfactory condition. There will sometimes be appreciable delays in transit; there will sometimes be breakdowns in the cabinets and interruptions in the supply of electricity of sufficiently long duration to affect the contents of the cabinets. Manufacturers should, therefore, give particular and precise instructions to retailers as to the action they should take in such cases.

Packaging Standards

The Committee stated that it was difficult to recommend detailed standards of packaging because:

(*a*) There appears to be a lack of data which can give guidance on the effect on packaging materials of the technical processes of production and the mechanics of deterioration of the foodstuffs themselves.
(*b*) There is doubt of the availability of information on the problems of water vapour transfer through the various packing materials at low temperatures, and of facilities to provide such data.
(*c*) They may prove unnecessarily restrictive and inflexible when viewed in the light of the freer supply of raw materials and the greater scope for research and experimentation.
(*d*) The various materials at present in use do not reflect the best possible level on which to formulate permanent standards in view of possible progress and development in this field.

There is a need, within the industry, for more scientific data on the various types of packaging materials in use for the different quick frozen products; such data should relate to the characteristics of the material when formed into a finished package round the foodstuffs concerned and should take account of any reaction between the wrappings and the foodstuffs; furthermore, any standards of packaging must be on a basis sufficiently broad to allow some latitude for individual producers and must, consequently, be that of performance.

The majority of responsible manufacturers are using the best possible materials consistent with the marketing of high quality products and their own commercial interests. Since most of the packaging materials currently in use in the industry have satisfactorily stood the test of time, they can, as a first stage, be safely designated as minimum standards of packaging.

It is therefore recommended

(*a*) that standards of packaging be based on materials currently in use in the industry. This recommendation is linked with the necessity always to maintain suitable temperatures and to ensure that the foods will reach the retailers in a satisfactory condition;

(*b*) that these standards of packaging materials currently used by the industry be according to the specifications broadly described in an Appendix to the Report;

(*c*) that these standards of packaging materials shall form the basis of a voluntary code of practice for the industry;

(*d*) a survey be made in order to obtain technical information by service tests on various packs.

Attention is drawn to discussions on similar lines which the British Standards Institute may be initiating and the discussions taking place within the White Fish authority with regard to packaging materials for fish.

Composition for Fruit

For fruit packed in syrup, namely, blackcurrants, loganberries, peaches, pineapple, raspberries, whole strawberries, cherries, blackberries, redcurrants, peas, apple (as a syrup pack), apricots, plums, grapefruit, melon, the minimum fruit content shall be 55 per cent and shall be described as "Fruit (named) in Syrup."

For fruit packed in sugar, the minimum fruit content shall be 75 per cent. and shall be described as "Fruit (named) in Sugar."

For fruit salad in syrup, the minimum fruit content shall be 55 per cent.

made in bakeries to find how many loaves are produced from a ton of flour under various bakery conditions. The work was undertaken at the request of the Price Control Division, Department of Industries and Commerce, but the opportunity was taken to measure the yield losses from various causes, and to study the difficulties bakers have in achieving the loaf weights required by law.

Average loaf weights must be high enough to prevent downward variations from resulting in underweight loaves. It was found that the extra weight needed to cover weight variations with an exceptionally good divider meant a loss of yield of 12 lb. and with a poor divider 74 lb. of bread from a ton of flour. Ovens that give uneven weights are responsible for similar losses in yield. Findings of this kind can be used to determine whether machinery should be overhauled or replaced.

Baking and cooling losses varied by as much as 130 lb. of bread per ton of flour for one kind of bread. This means that some bakers have to use about 1½ oz. more dough than others to reach a 2 lb. loaf weight. Because of this, an Australian system of regulating the sale of bread by dough weight instead of loaf weight is being examined from the technical standpoint.

Research in New Zealand

In the report of the Fats Research Laboratory contained in the twenty-seventh annual report of the Department of Scientific and Industrial Research, New Zealand, are outlined studies on mutton tallow which show that there are present many minor constituents that had hitherto escaped the observation of other workers.

Branched-chain fatty acids, including d-12-methyltetradecanoic acid, 13-methyltetradecanoic acid, d-14-methylhexadecanoic acid, and a C_{17} acid containing two methyl or homologous side chains, have been isolated from mutton tallow.

In association with the Dominion Laboratory's dehydrated meat project, an investigation is being made of the changes in fats during processing and storage. Some preliminary work has been started on the elucidation of the nature of the complex lipids in the fats of the muscles and organs of beef animals.

Because of the low stability of mutton tallow and the earlier complaints from Great Britain on the quality of this product, continued attention has been given to the study of antioxidants, particularly in regard to the use of additives that are harmless and likely to meet with the approval of the British Ministry of Food. It has been found that citric and tartaric acids have a greater stabilising effect on animal fats than hitherto supposed. Citric acid is not readily incorporated into fat, but this difficulty has been overcome by using the mixed glycerol esters of citric acid and fatty acids (New Zealand patent applied for).

In the report from the Wheat Research Institute is described the extensive series of observations

The Leonard Hill Technical Group

Articles published in some of the associate journals in the Leonard Hill Technical Group this month include:

Corrosion Technology.—Corrosive Nature of Combustion Gases; Painting for the Protection of Outdoor Structures.

Chemical & Process Engineering.—Changing Concepts in Chemical Engineering; Synthetic Fats, Soaps, and Allied Products, Part II.

Manufacturing Chemist.—Extraction of Animal Products; Organic Microanalysis, Part II.

Paint Manufacture.—Thermal Radiations and Paint Films.

Petroleum.—Trends in Modern Viscometry, Part III; Gamma Radiography in Oil Storage Installations.

The Manufacture of Cucumber Products in Sweden

Knut Almgren
Swedish Institute for Food Preservation Research.

Swedish farmers are changing from all-round farming to specialisation in intensive cultivation of cucumbers for pickling.

A clear distinction is generally made between two kinds of processed cucumber products: pickles and quickles. Pickles is the old name for widely divergent products cured in brine of different strengths, where a natural fermentation takes place, and subsequently made into the final product either with or without washing in water. Quickles, on the other hand, is a recent American term for products made from fresh green cucumbers by the quick pasteurising process rather than the long fermentation curing process.

THE semi-manufactured product—the brine-stock—is usually the real basis of the large scale pickles industry, mainly because this stock can be stored from year to year, thus allowing the packing work to be extended over a long period instead of the short season when the cucumber crop reaches the factories. Quickles is a seasonal product, rapidly gaining favour because of its attractive taste and its good keeping quality. There are still consumers who are of the opinion that only the cured product possesses the firm, crisp, transparent structure which is worthy of their attention as a genuine delicacy, while quickles are viewed as profane substitutes, but the development on the market shows a growing demand for the latter, resulting in its increased production. The main problems of the Swedish factories are how to meet this increasing demand and how to manage the peak loads, when favourable conditions bring about good cucumber harvests.

It is impossible to give exact figures for Swedish production; some packers have reported an estimated yearly amount of about 5,000 tons for industrial pickling. Cultivation of cucumbers for pickling purposes is an uncertain operation in Sweden because of the dependence of the crop on weather conditions, only certain districts of the country being suitable for cucumber growing. Because of labour difficulties, many small scale farmers have changed from all-round farming to specialisation in intensive cultivation of vegetables, berries, fruits, and other crops. In this connexion, it is possible that there will be an increased cultivation of cucumbers for pickling in the most suitable districts.

To meet the increasing demand for cucumber products, it is necessary for Swedish manufacturers to take the following steps:

1. Increase the production of cucumbers.
2. Produce better varieties.
3. Adopt better cultivation techniques.
4. Extend the pickling season.

Variety and cultivation problems are being studied by agricultural specialists attached to factory staffs. The prolonging of the processing season is of the greatest importance and is closely connected with the concentration of production upon quickles only or upon both quickles and genuine pickle products, made from the salt stock.

In the large scale factories with up-to-date equipment, cucumber pickling is of secondary importance, production being based upon several products, such as peas, beans, tomatoes, asparagus, beetroots, mushrooms, berries, mainly strawberries and raspberries, apples, pears, oranges, cherries, and plums. There are not more than five such large scale

Swedish canning factories dealing with cucumber products, one of which handles a daily capacity of three million cucumbers from 450 growers.

After harvesting, the cucumbers are taken to the first stage of the production line, where they are washed in cold water. They are then conveyed to the sorting and grading equipment for the removal of unsatisfactory cucumbers and the separation into different sizes. For quickles production, suitable cucumbers are pickled and then packed in spiced liquor in relatively large tins.

Only a few of the factories are equipped with modern pasteurisation lines constructed on the American pattern and allowing a sufficient control of temperature at the different stages of heating and cooling. The common method is still sterilisation in an exhaust box.

In the small scale plants, usually evolved from market gardens where the gardener has tried to find a new way of marketing his cucumbers and other vegetables suitable for pickling, pickles and quickles of good quality are being produced.

The cucumbers are washed in cold water.

Basis of Cucumber Products

The Swedish factory-made cucumber products are based upon old-fashioned recipes according to the taste of the consumers, the two principal kinds being vinegar gherkins and salt gherkins. Their keeping quality depends on the strength of the richly spiced liquor in which the gherkins are put down. It is not customary to allow the cucumbers to undergo any fermentation process, but in some cases pickling is combined with such a process, which is stopped after a day or two, as is the case with the American Overnight Dills.

In the sorting and grading department, faulty cucumbers are rejected and those for pickling are graded.

Some examples of typical small scale Swedish formulae are given below.

Sour Gherkins (Fermented)

Cucumbers	50–70
Blackcurrant leaves ...	300
Sprigs of dill	10–15
Mustard seeds	2 oz.
Water	3¼ gal.
Salt	1 lb.
Vinegar	3½ pints

Every cucumber is wrapped in blackcurrant leaves and placed in a wooden pail, layer after layer, between which the dill sprigs and mustard seeds are spread. The water is boiled with salt; after cooking, the vinegar is added. The liquid is poured over the cucumbers, and the pail is left with cover open until fermentation is over, when salt water is filled

Large cans of Swedish gherkins are loaded for transport.

to the brim, and the container is covered. The gherkins are ready for use in about two weeks.

Small Vinegar Gherkins

Small cucumbers ...	50
Sugar	4¼ oz.
Vinegar	1¾ pint
Shallots	10
Red pepper ...	1 hull
Scanian mustard ...	2 lb.

The cucumbers are placed in a strong brine overnight, and then dried. The vinegar is boiled with shallots and spices for five minutes and the cucumbers are put in and boiled for a moment. Immediately afterwards, they are placed in jars and the boiling vinegar is poured over. After one week, the vinegar is removed, boiled for 15 minutes, and poured over the cucumbers again.

Salt Favourite Gherkins

Small cucumbers	50
Alum	⅞ oz.
Tartar	⅛ oz.
Crude salt ...	13 oz.
Water	1½ gal.
Vinegar	1½ pint
Cubed horseradish	Small piece
dill; oak, blackcurrant, and cherry leaves.	

The cucumbers are washed in cold water and kept in cold fresh water for 24 hours before pickling. Leaves and heads of dill are spread on the bottom of a suitable jar and the cucumbers are put down, alternating with layers of leaves and dill so that no part of a cucumber can touch another.

The top layer should consist of leaves. The brine is poured over and the jar is left to stand until the following day, when it is covered and tied down. The gherkins are ready after two months.

Factory-made cucumber products contain many of the ingredients of these home recipes.

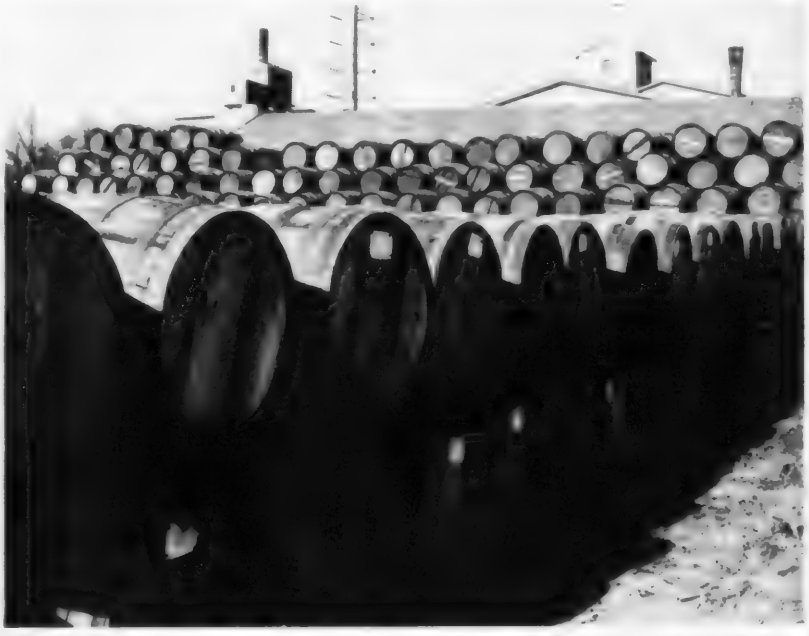
The main processed cucumber products in the market are:

QUICKLES.—*Vinegar gherkins.* Production of these accounts for about 60 per cent. of the pickled cucumbers on the market. Whole, fresh, green cucumber is canned in a solution of vinegar with salt, dill, and other spices, and pasteurised. The keeping quality is good.

Salt gherkins. A genuine Swedish product, canned in brine with vinegar and dill as added ingredients, the main spice being dill, and pasteurised.

PICKLES. — *Salt pickle gherkins.* Some small scale manufacturers put the cucumbers into a special salt solution, flavoured with dill and spices, where they are cured and finished entirely by a process of natural fermentation, in the same way as the American "genuine dills," but with quite a different flavour. Some large scale producers make salt pickle gherkins from brine-stock after freshening. These pickles are finished like the American "processed dills," but have the genuine flavour of the Swedish salt gherkins. The salt gherkins are packed into wooden pails and sold retail

(*Continued on page 324*)



Salt gherkins are stored in casks of oak. During fermentation, they must be kept under the open sky.

Abstracts From Recent Food Literature

Cyanocobalamin (Vitamin B_{12}). A. Bartilucci and N. E. Foss (*J. of the Amer. Pharm. Assoc.*, 1954, **43**, 159).—The effect of *p*H on the stability of solutions of cyanocobalamin and ascorbic acid, alone and in combinations, is reported. The effect of a contaminant complexing agent at one concentration on aqueous solutions of these vitamins is also reported. The stability of these vitamins, alone and in combination, in various mixtures of propylene glycol, Sorbo, syrup, glycerin, glucose, and distilled water has been determined.

Differences in Quality in the Aroma of Norwegian Vegetable Products. E. Hoffstad (*Tidsskrift for Naeringsmiddelindustrien*, 1954, **7**, 71).—Following a thesis put forward by Schübeler in 1886, the author has found that the aroma of plants, *i.e.* their contents of essential oils, increases both in quantity and in quality with the degree of latitude and with the altitude above sea level. The aroma of plants is at its best in the mountains of Northern Norway where the aroma is produced by the long daylight exposure during the summer. The sugar contents, on the other hand, depend not on the light but on the heat absorbed, and therefore decrease with the latitude. However, as the sugar contents of industrial food products can easily be varied through the judicious admixture of glucose, while the aroma cannot be varied so easily, Norwegian products made from vegetable matter have a particularly high quality which could be commercialised to a greater extent than is the case at present.

The Isolation of an Anthocyanin and Chlorogenic Acid from Canned Victoria Plums. T. L. Parkinson (*J. Sci. Food Agric.*, 1954, **5**, 239).—A method is described by which chlorogenic acid and cyanidin-3-monoglucoside are isolated from the liquid portion of canned Victoria plums, so that they may be used in studies on the rate of corrosion of cans of fruit. In the first stage, these substances are separated from all other constituents by adsorption on activated alumina, followed by elution with malic acid solution. In the second stage, they are isolated from each other by partition chromatography on a column of cellulose powder. Paper chromatography and adsorption spectrophotometry were the main techniques used for the identification of these substances. It appears that the spectrophotometric characteristics of liquors from canned Victoria plums are due mainly to the anthocyanin in the visible region and to chlorogenic acid in the ultra-violet region. The presence of quinic acid in canned plums has also been demonstrated.

The Survival of Bacillus Subtilis Spores in the Baking of Bread. F. J. Farmiloe, S. J. Cornford, J. B. M. Coppock, and M. Ingram (*J. Sci. Food Agric.*, 1954, **5**, 292).—The survival of *Bacillus subtilis* spores at temperatures near 100°C. was determined in buffered suspensions. Known numbers of these spores were mixed into dough which was baked normally into bread. Temperatures taken near the centre of the loaf, near the crust, and midway between the two showed that the temperature within the loaf was 100° to 101°C. and this was only just attained at the centre. These temperatures were comparable with similar measurements in various baked products. Viable counts were made on the dough just before entering the oven and on baked samples taken at the thermocouple positions. Corresponding loaves were incubated at 37°C. In buffer solutions, vegetative cells were killed in about two minutes at 75°C. The thermal death time curves for spores were not exponential, a small proportion of the spores surviving for relatively long periods. In dough, about half the spore germinated between mixing the dough and putting it into the oven. Comparison of the survival of the spores in the bread with that expected from the temperature treatment and from the experiments in buffer solutions suggested that the heat resistance in bread is roughly the same as, and certainly no less than, that in a phosphate buffer of *p*H 6·5. Only a small proportion of the surviving spores generated ropy patches within a week, owing perhaps to peculiarities in water distribution within the loaf.

Structural Changes in the Nutrition of the German People from 1935 to 1952. K.-H. Wagner (*Fette, Seifen, Anstrichmittel*, 1954, **56**, 303).—The author, who is in charge of the German Institute for Nutrition Research at Giessen, discusses certain fundamental changes which, according to the official statistics, have taken place in the nutrition of the German people since 1935. Consumption of bread and potatoes per head of population has steadily declined. Vegetable consumption has also declined, but this is balanced by a slight increase in fruit consumption. Milk consumption per head of population is now below what is regarded as adequate, and butter has been partly ousted by margarine. Meat consumption, although it has not yet regained the pre-war level, is comparatively high.

New Portable Machine for the Manufacture of Seamless Polyethylene Bags. R. Mouchet (*Revue Technique de l'Industrie Alimentaire*, 1954, **2**, May, 28).—After listing the particular advantages of transparent, impermeable, and completely hygienic wrappings of polyethylene, the author describes a new machine which serves to seal polyethylene bags by means of radiated impulse heat causing molecular agglomeration, rather than by the usual method of applying pressure through heated jaws, the use of which wastes time by reason of the need for subsequent cooling. During trial runs, the machine, which weighs no more than 22 lb., has been able to deal with 100 bags a minute, about 10 times the output of pressure-type machines.

Manufacture of Syruped Fruit. C. Lagneau (*La Revue de la Conserve de France et de l'Union Française*, 1954, **9**, May, 45).—Various aspects of the fruit syruping process are described. The fruits must not only be of good quality but also of an appropriate degree of ripeness which differs between species and varieties of

fruit; absence of foreign matter is essential; the sugar must contain neither sulphur nor sulphurous acid; cans should preferably be of the lacquered type; the syrup should be boiled and carefully filtered, and should never be kept longer than 24 hours before use. The author discusses weight fluctuations and losses through "blown" cans.

The Detection of Antiseptics in Canned Meat (*Revue de la Conserve de France et de l'Union Française*, 1954, **9**, May, 98).—As the admixture of antiseptics or chemical preservatives to canned food is forbidden in many countries, including France, the detection of fraudulent use of such antiseptics is a problem of some importance. While frequently used preservatives, such as benzoic acid, salicylic acid, and borax, can be detected easily enough, the detection of unspecified lesser known antiseptics by means of chemical analysis is sometimes difficult. A quicker method, developed by Drieux and Thiéry of the French National Veterinary College and more specially designed for canned meat, is based on bacteriological tests. The contents of the suspected can are first tested for micro-organisms. If none are found, it is decided by means of a second test, using *Bacillus prodigiosus*, whether the absence of micro-organisms is due to efficient sterilisation or to the use of a forbidden preservative.

Olive Oil Production. W. Schneider (*Fette, Seifen, Anstrichmittel*, 1954, **56**, 326).—A discussion of the advantages and disadvantages of the traditional intermittent method of olive oil production and of modern continuous methods, using a press of the worm gear type which serves to separate an oil-water emulsion from the pulp, the emulsion then being centrifuged to separate oil and water. In each case, the quality of the oil depends greatly on the picking and storing methods employed. The best oils are obtained from fresh fruits, so that the higher speed of continuously working plants is an important advantage. Among others are the greater compactness of the plant, the greatly reduced labour requirements, and the improvement in hygienic conditions.

Technology of German Margarine. J. Kremerskothen (*Seifen, Ole, Fette, Wachse*, 1954, **80**, 295).—Brief survey of the principles and technique of margarine production in Germany. Having described the principal emulsifying agents used (Tegomuls, Paalsgaard emulsion oil, Sojalecithin) and the way in which they work, the author gives a concise account of the preparation of the fat mix and water admixture, and of the churning process itself, the subsequent cooling of the emulsion by means of chilled rollers, the kneading or "working" of the raw margarine, and the moulding and packing of the commercial product.

The Theory of Meat Hydration. F. Niinivaara and M. Pohja (*Die Fleischwirtschaft*, 1954, **6**, 192).—Using a method, developed by Grau, for the determination of meat hydration, the authors have investigated the changes in the water absorption of meat caused by common salt. These changes are ascribed to the displacement of the isoelectric points of meat proteins. It was found that these points are situated within the *p*H range of 5·1 to 5·5 which corresponds to a minimum of water absorption, while higher or lower *p*H values invariably result in an increase.

Industrial Utilisation of Citrus Fruits in Italy (*Chemische Industrie*, 1954, **6**, 272).—A survey of the present state and trends in the industrial utilisation of citrus fruits in Italy. In the Mediterranean countries, production has outpaced the demands of the market so that there is a case for diverting part of the production from the export of non-processed fruit to the industrial manufacture of fruit juices, essential oils, pectin, etc. There is a potential market for the expansion of such production, provided the most modern technological methods are used so as to reduce cost and improve the quality. There is an increasing tendency to make better use of the residue of citrus processing, *e.g.* for the extraction of vitamin P (citrin, rutin).

"Uperised" Milk Preserves the Taste of Fresh Milk. P. Grassi (*Alimentazione*, 1954, **4**, April, 18).—A report of a visit to a new Swiss milk treatment plant at Godolfingen where a new process has been successfully carried out. In this process, the milk is vacuum treated, then shock heated to 150°C. for no more than three-quarters of a second, and subsequently homogenised. It is claimed that milk thus treated has the same vitamin contents as pasteurised milk and can be preserved at ordinary room temperatures for a considerable time without becoming sour or losing the taste of fresh milk.

Influence of Relative Humidity and Circulating Speed of Air on the Freezing of Muscat Grapes. A. Gac (*Fruits*, 1954, **9**, 163).—All the conventional methods of preserving grapes for long periods affect the taste of the fruit. Certain varieties, such as Black Muscat of Alexandra, are suitable for refrigeration. The French Cold Storage Research Station at Bellevue has carried out a systematic research programme in order to determine the influence of (*a*) temperature, (*b*) relative humidity, and (*c*) air circulation speed on the keeping quality of these grapes. It was found that preservation is most satisfactory in atmospheric air at 32°F., and a relative humidity of 0·8. In these circumstances, it would be possible to preserve fresh vintage muscat grapes until Christmas without deterioration in appearance, taste, flavour, or texture.

The Manufacture of Cucumber Products in Sweden

(*Continued from page 322*)

by the piece or by weight. As is the case with American "genuine dills," these gherkins are easily destroyed, especially by scum-forming yeasts. The addition of certain selective chemicals has eliminated the presence of undesirable bacteria, leaving the lactic acid bacteria intact.

Besides these gherkins, Swedish manufacturers make other products, such as crosscut pickles and quickles made to suit special local demands (as Scanian crosscut vinegar quickles) packed into glass jars or small tins, and pasteurised. One manufacturer also makes a type of sweet relish based upon brine-stock. Mixed pickles are also marketed.

News from the Industry

FORTHCOMING EVENTS

The Nutrition Society

On October 23, the Scottish Group of the Nutrition Society will hold a symposium at Dundee on "Disorders of the Alimentary Tract and their Nutritional Effects." It is hoped to include one or more papers on food allergies.

A symposium will also be held on November 20 at the Middlesex Hospital Medical School on "The National Food Survey of Great Britain."

The Food Education Society

Among the speakers at a meeting of the Food Education Society, held in London on June 23, devoted to the discussion of the Food and Drugs Amendment Bill were Lord Hankey, P.C., G.C.B., G.C.M.G., G.C.V.O., F.R.S., who was in the Chair, and Lord Sempill, A.F.C., who took as his theme those sections of the Bill dealing with the description of foods. He advocated a full description of the ingredients of all foods on the label so that housewife and consumer would be able to see what they were buying. A full report of this speech will be found on page 297.

Dr. Franklin Bicknell was concerned lest the introduction of chemicals into food before adequate testing might adversely affect health.

The point of view of the food manufacturers was given by Mr. Colin Dence, President of the Food Manufacturers' Federation.

The chairman called upon Dr. Barnett Stross, M.P., Mrs. Doris Grant, Lord Douglas of Barloch, and Mr. Norman Dodds, M.P., who were in the audience, to give their views on the Bill.

The large audience was drawn from the food and chemicals industries, public, medical, and scientific bodies and institutes, women's organisations, and advertising agents.

A.G.M. of B.F.M.I.R.A.

At the Eighth Annual General Meeting of the British Food Manufacturing Industries Research Association, Sir Frank Engledow, C.M.G., M.A., F.R.S., Drapers' Professor of Agriculture, University of Cambridge, late chairman of the Food Investigation Board and chairman of the Governing Body of the College of Tropical Agriculture, was re-elected President of the Association. Mr. J. G. Mathieson (Clarnico) and Lt.-Col. G. R. Harding, D.S.O., M.B.E. (Aplin and Barrett), were both re-elected Vice-Presidents, and in addition to 10 retiring members of the Council re-elected to office, Mr. V. C. Hender (Mars), Dr. A. G. Lipscomb (John Mackintosh and Sons), Mr. W. Pendrill (Harry Peck and Co.), Mr. H. M. Beak (Foster Clark), Mr. M. A. A. Hugon (Hugon and Co.), and Mr. E. M. Learmonth (British Soya Products) were elected members of the Council.

The annual reports and accounts for the year ending December 31, 1953, were duly adopted and members then heard the Presidential Address by Sir Frank Engledow on "Chemicals in Food," a report of which is published elsewhere in this issue.

In his chairman's report, Mr. E. E. Wells (Rowntree and Co.) thanked members on behalf of the Council for the splendid manner in which they had accepted the increased subscription rates implemented this year. Sufficient income had been received to ensure the minimum Government Grant payment of £12,000 and in addition it was anticipated that over £3,000 additional Grant would be earned. The margin between the minimum amount upon which any Grant at all might be claimed and the actual subscription income expected to be raised in the current year was not so great, however, that any relaxation of efforts to increase membership could be permitted. Strenuous attempts were being made to attract new members and once again the chairman appealed to existing members to make every effort to introduce new members from other firms in the industry with whom they were in touch.

Returning competition and freedom from controls did not mean that the industry could afford to be complacent, neither could it hope to progress without co-operative research and utilisation of all the aids to greater productivity and avoidance of waste afforded by science. Government legislation, while being eased in one direction, tended to tighten in others and as certain sections of the industry were extremely vulnerable in this respect the Association could not for one moment relax its vigilance. These points might well be emphasised in any approach members made to non-member firms, together with the reminder that the industry compared unfavourably with many other less vital and important industries in the support which it gives to its Research Association, and there was little cause for satisfaction in this fact.

In conclusion, the chairman thanked those members who had so generously subscribed to the Land Building and Equipment Fund and whose loyal support made possible the building and equipping of the splendid new laboratories at Leatherhead. The total cost of this project had been £123,873 and since the Fund was started seven years ago, members had subscribed nearly £81,000 which had earned a Government Grant of £39,411. With the addition of just over £2,000 earned on the investment of early donations the total sum thus raised was £122,322, which left a financial deficit on the Fund of £1,553. The Council had decided that the Fund should now be closed and this amount charged against the Association's general funds.

At the Council meeting immediately following the Annual General Meeting, Mr. E. E. Wells was re-elected chairman of the Council for the ensuing year and Mr. R. P. Woollard (London Oil Corporation) was re-elected deputy chairman.

Distilled Monoglycerides

The most widely used type of emulsifier is glyceryl monostearate and past research has proved that it was its monoglyceride content that was its active part, and that the remainder of the mixture had a definite depressing effect upon it.

For some years past, Advita Limited (who are well known as suppliers of emulsifiers used in a wide range of food products) have been investigating means of preparing the monoglyceride in a pure state and have found that molecular distillation is the answer. They are now able to announce their ability to prepare a product of 90 per cent. monoglyceride content, as compared with 32 per cent. hitherto available. This has been registered under the brand name of Hymono.

The process of molecular distillation not only concentrates the monoglyceride but acts as a refining operation, removing unwanted materials and deodorising at the same time; thus the monoglyceride, as produced, is non-self-emulsifying. If, however, self-emulsifying types are required, they can be simply produced by the addition of a suitable proportion of the sodium salt of the fatty acid to the pure monoglyceride.

At present, Hymono is being produced in flake form only, but it is anticipated that it will be available in powder form at a later date.

The increased activity of Hymono should prove of interest in all industries where emulsifiers are used. At present, production is mainly confined to the preparation of the stearate, but there is no technical reason why oleates and other monoglycerides cannot be prepared for individual requirements.

Molecular distillation naturally increases production costs, but this is in most cases offset by economy in use, thus the price of £550 per ton represents a saving.

APPOINTMENTS AND RETIREMENTS

Mr. Walter John Hurran, B.Sc., F.R.I.C., until recently managing director of the company's New Zealand subsidiary, has been appointed an Executive Director of Glaxo Laboratories.

▪

Mr. J. M. Thrussell, sales director of the United Glass Bottle Manufacturers, has by reason of ill-health relinquished his seat on the Board on his retirement from the company.

▪

Willesden's Borough Engineer and Surveyor, Mr. J. C. Morris, B.Sc., A.M.I.C.E., F.R.San.I., has been appointed chairman-elect of the Council of the Royal Sanitary Institute. He will take up his new office in October.

▪

Sir Hugh Beaver, M.Inst.C.E., M.I.Chem.E., has been appointed chairman of the Advisory Council for Scientific and Industrial Research in succession to Prof. Sir Ian Heilbron, D.S.O., D.Sc., LL.D., F.R.I.C., F.R.S., who retires on September 30, 1954, on completion of his term of office.

▪

The period covered by the present appointments of some of the members of the National Research Development Corporation expired on June 27, 1954.

The President of the Board of Trade has reappointed Sir Percy H. Mills, Bt., K.B.E., chairman and Prof. P. M. S. Blackett, F.R.S., M.A., Sir John McL. Duncanson, and Sir Edward de Stein members for a further period.

The President has appointed Sir Henry Hinchcliffe, D.L., J.P., and Sir Alan Saunders, O.B.E., in place of the retiring members, Sir Edward Hodgson, K.B.E., C.B., and Mr. W. E. P. Johnson, A.F.C., A.F.R.Ac.S., C.P.A.

▪

Dr. Francis Aylward, who has been Head of the Department of Food Technology at Borough Polytechnic, has been promoted to Head of the Chemistry and Food Technology Department, on the retirement of Dr. E. C. Pickering, F.R.I.C.

Mr. James Stewart, who has been Senior Assistant at the National Bakery School during the past 27 years, is retiring from teaching and will be devoting his time to his business interests in future.

As a result of these changes, Mr. G. T. S. Bamford has been promoted to Head of the National Bakery School. Mr. Bamford was a former student of this school and later on was in charge of the Bakery School at Hull. He was appointed a full-time teacher at the Borough Polytechnic shortly after the termination of the war.

Mr. ' James Lambert, another teacher of this school, has been upgraded from an A grade to B grade teacher. Mr. West of Hendon has been appointed to the teaching staff of the National Bakery School. He has been a part-time teacher at Hendon for some years and is also a past full-time day student of this Bakery School at the Borough Polytechnic.

Equipment for Confectioners

Following the recent introduction of several new series of essences, the Confectioners' Vegetable Colours and Fruit Essences Co. have recently extended their interests in the machinery field. Apart from the fondant depositing machine which they have manufactured for some years, they now have an agreement with A. E. Neilsen of Denmark for the sole selling rights in this country of the Nielsen chocolate enrobers; an agreement for the selling rights of fondant enrobers is also to be completed.

The smallest of the series, the Baby enrober, is a versatile machine, equipped for either top covering, bottoming, or both. These machines are competitive in price and have met with wide interest, particularly for biscuit and cake enrobing. The company also offers a first-class quality chocolate couverture.

The demand for the rubber fondant mats, introduced by the firm many years ago, is so great that efforts are being made to increase output and allow for a more speedy delivery.

R.S.I. Concessions

To assist newly qualified persons, the Royal Sanitary Institute announces an addition to its by-laws whereby those who qualify for Ordinary Membership by virtue of having passed an examination of the Institute shall in respect of the year in which they are first elected (excluding transfers from one grade of membership to another) pay no subscription.

The same concession is also to be made to those who qualify for Associateship through having passed an examination of the Institute, the R.S.I. and S.I.E. Joint Board, or the National Nursery Examination Board.

The Building Surveyors (both municipal and non-municipal) and the Quantity Surveyors examinations of the Incorporated Association of Architects and Surveyors, held since May, 1952, will in future be accepted as a qualification for Associateship of the Institute.

It is also announced that a certificate of the National Nursery Examination Board will be accepted as a qualification for Associateship of the Institute.

The Institute has created the new grade of Affiliateship, affiliates being elected by the Council from persons interested in promoting all or any of the Institute's objects.

This new grade of membership has been instituted for the benefit of the many persons interested in promoting the health of the people who wish to support and be associated with the work of the Institute, although not possessing the qualifications required under the by-laws for Ordinary Membership or Associateship.

Prize Essay Competitions

A number of prize essay competitions are announced by the Royal Sanitary Institute, the closing date for which is December 31, 1954.

The John Edward Worth Prize is to be awarded for the best essay on "The Advantages and Disadvantages in the Use of Alternative Materials as Substitutes for Traditional Materials in Building Construction, Sanitary Appliances, and Fittings." The award, which will take the form of a cash prize of £70, is to be used for the study of domestic sanitary science in Europe.

The John S. Owens Prize is to be awarded for an essay on "Modern Practices in the Conservation of Heat, with special references to Smokeless Fuel Appliances." The prize will consist of 20 guineas.

A prize of £21 is also to be awarded for the best essay on "Suggestions for the Training of Health Visitors to meet the Present-day Conception of the Health Visitors' Work."

The competitions are open to all, except the one relating to the John Edward Worth Prize, in which entries are restricted to persons resident in the British Isles.

National College of Food Technology

The new courses at the National College of Food Technology will begin on October 4 next. Intending students should make early application for admission to the Principal, Cranwood Street, City Road, London, E.C.1.

The aim of the main two-year course in General Food Technology is to give a sound technological training to those who are directly concerned with the control of food processing operations or engaged in laboratory control. This full-time course is also suitable for those who wish to take some training before entering the industry. The fee is £60 per annum. The College is well equipped with laboratories and with pilot-scale food processing plant for such operations as canning, dehydration, and refrigeration.

Post-graduate courses in General Food Technology, Applied Microbiology, and Food Quality Control are also offered to science graduates. Each course lasts one session of three terms, and the fee is £60.

Automatic Control in Milling

Three grinders or pulverisers fitted with Simon Velofeeders and automatic electronic controllers will, it is claimed, do the work of four grinders not equipped with positive automatic control of this kind. The controllers ensure that the feeders load the grinders steadily, reducing maintenance to one-third of that required in manually set grinders; there is a saving of labour, as little supervision is required; and power drive efficiency is increased by up to 5 per cent. as the driving motor works at full load instead of a usual 66 per cent. of load.

The Velofeeder is a mechanical vibratory feeder, and the amplitude of vibrations can be varied to adjust the rate of feed through a very wide range. It has a small, geared reversing motor, which alters the feed rate adjustment mechanism in either direction as signalled by the automatic controller.

The controller receives current directly proportional to that taken by the motor driving the grinder or pulveriser; if this current falls below the full-load current of the motor, the controller regulates the small geared motor gradually and the rate of feed to the machine is increased. If the current exceeds the full-load current of the motor, the feed rate is gradually reduced. Usually the controller is so arranged that there is a dead spot covering plus and minus 2½ per cent. of full-load; inside these limits no correction takes place. It is found that this eliminates hunting.

The increase in power factor of the motor also offers an economy to those whose electrical tariffs are based on a maximum K.V.A. demand, reducing the electricity debit.

Both the Velofeeder and the automatic controller are of extremely robust construction, designed for continuous 24 hour service in dusty atmospheres.

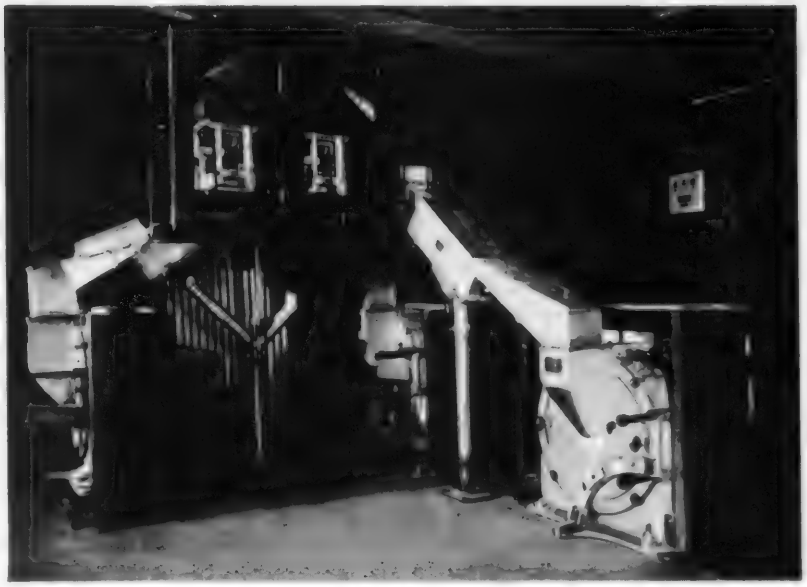
Fractional Horsepower Motors

In 1945, the directors of British Thomson-Houston set in motion a plan to change over their Newcastle-under-Lyme works from armament to fractional horsepower motor production, sharing the load with the older established works at Coventry.

The second part of the plan was to lay down three production units to deal with the quantity production of the various classifications of motors; one unit for standard FHP motors, another for semi-standards, and another for special motors. These units were working in 1948, their use being extended in 1949 by shift working.

Some indication of the way this factory has built up is registered in the despatch of its one millionth fractional horsepower motor in May, 1954.

The teams concerned with the development of these plans were also charged with making motors, one result of which was that in 1951 it became necessary to embark on a further scheme of expansion at this Newcastle-under-Lyme factory. The one millionth FHP motor comes from that works at a time when a fourth and most modern production unit is completed and about to add a further 30 per cent. to BTH capacity.



Three grinders with Velofeeder control unit at Bibby's Compound Mill, Liverpool.

Plastics at Farnborough

At a Press Conference held at Farnborough by the Telcon Plastics Division of the Telegraph Construction and Maintenance Co., Mr. H. F. Wilson, managing director, explained that, in the past, the company's activities in the plastics field had not achieved the same prominence as its cable activities, but within the past 18 months, there had been a rejuvenation of the former to the extent that the Articles of the company had been considerably widened to embrace participation in all manner of projects.

The factory at Green Street Green, Farnborough, used as a dispersal one during the last war, had now been given over entirely to the work of the Plastics Division.

Mr. Wilson said that, concurrently with the celebration of the centenary of the company, those present were witnessing the re-birth of an organisation, as evidenced by the erection of an additional 15,000 sq. ft. of new buildings and also by the installation of modern plant side by side with old machines still in service.

The organisation was just about to go into production with a machine, the largest and most modern of its kind in Europe, and the first to be all-British built under American licences for the coating of paper with polythene, a material which Telcon was the first to use on a commercial scale.

Built by Bone Bros. and equipped with an 8 in. Francis Shaw extruder, the machine was capable of coating paper up to 6 ft. wide at a high speed. Such laminated material was used in the manufacture of multi-wall sacks and in the packaging industry generally and its use would thus have wide applications in the food industry.

Moulding and extrusion of plastics were but a fraction of their work, their aim being to do for customers what they could not get done elsewhere. As an indication of their versatility, Mr. Wilson quoted the following industries directly supplied by the company: aircraft, light engineering, food, clothing, bottling, boots and shoes, sports, cable, shipbuilding, electronic instruments, building, medical supplies, and many others, together with the various Government Ministries and Boards.

Visitors had the opportunity of inspecting a range of exhibits, from moulded gutta percha picture frames and a number of curious contraptions of 1851 to present-day articles of polythene.

At an excellent luncheon at the fifteenth century Donnington Manor, Dunton Green, Dr. V. E. Yarsley, President of the Plastics Institute, proposed the health of the company on behalf of the guests, responded to by Mr. Wilson and Mr. Dean, technical director.

Microbiologists in Partnership

Dr. E. C. Barton-Wright has entered into partnership with Mr. L. D. Galloway, industrial microbiologist, and the practice formerly carried on by the latter will continue under the style of Galloway and Barton-Wright.

Some of the Royal Doulton Lambeth ware which is to be produced on a large scale for the packaging of foodstuffs, chemicals, drinks, cosmetics, confectionery, and other products.

Pottery Containers for Food

More of Britain's food and drink will be sold in stoneware containers as the result of a decision by leading English potteries to produce greater quantities of this type of packaging material.

One of the biggest contributions to the increased output will be that of the Lambeth potteries, where Royal Doulton have devoted a special section of their factory to the manufacture of ceramic containers.

A number of recent export consignments, especially of whisky in decorative ceramic containers, have shown that the value of such goods is greatly enhanced by this type of packaging. A large quantity of Coronation whisky flasks made in stoneware achieved unprecedented popularity in the U.S.A. and Canada.

Heat-sealing Techniques

In some countries, *e.g.* Canada, regulations covering electrically heated equipment make it difficult to produce inexpensive heat-sealers of the type having a fixed and moveable heated jaw. It was suggested that these restrictions could be overcome by heating one jaw only and experimental work has been undertaken by British Cellophane to examine this possibility.

The experiments have been made with a sealing time of three seconds at 160°C. and 135°C.

Two sealers were used in this work:

(*a*) A hand operated Selec having fluted jaws, one only being heated.

(*b*) A Pyramid pedal operated having interchangeable plain or diamond patterned jaws (by A. H. Bland (Engineers) Ltd.). One or both jaws could be heated.

It was first confirmed that patterned jaws give a stronger heat-seal than plain jaws, the interlocking flutes or other pattern giving more intimate contact between the pieces of film being sealed and higher and more uniform pressures.

Heating one jaw instead of two produced only a slight reduction in seal strength with the patterned jaws; a much greater reduction was obtained with the plain jaws.

The thickness of the film was also found to exert an effect and with 600 gauge increased temperature and/or time of contact becomes necessary if the highest seal strengths are required.

Covering the unheated jaw with silicone rubber ($\frac{1}{8}$ in. thick) increased the seal-strength slightly with patterned jaws but gave a greater increase with plain jaws. If, however, the pattern is too small, the rubber cannot penetrate the hollows and the benefit of the soft jaw is lost.

Satisfactory seals can therefore be obtained if only one jaw of a bar sealer is heated; lining the other jaw with a soft silicone rubber ensures good contact between the films to be sealed and enables uniform pressure to be obtained, and carefully mated jaws are no longer necessary. Only one jaw needs to be made with a fairly open pattern and absolute uniformity is not essential. Manufacturing costs should be appreciably reduced.

In practice, the sealing time might be reduced by a fast working operator. The advantages of lining one jaw with silicone rubber would be increased under these conditions but poorer results would be obtained with one heated jaw and no rubber. The effect of thickness differences would be more pronounced with shorter times.

Electronics Exhibition

The second prototype of the flying spot microscope developed from the original model shown last year was displayed by Cinema-Television at the Manchester Electronics Exhibition. Basically, the equipment permits any normal microscope slide to be viewed on a cathode ray tube with the following advantages:

1. Greater magnification.
2. Greater resolution.
3. Variable contrast of specimen by electronic control.
4. Large audience viewing facilities.
5. Provision for automatic counting and sizing, etc.

Another exhibit was the industrial electronic metal detector, which detects the presence of any metal, ferrous or non-ferrous, in any non-metallic product, an automatic voltage regulator, an incremental inductance bridge, and a signal level meter.

New Range of Bearings

A new range of clutch withdrawal bearings and water pump spindle bearings has been introduced by Pollard Bearings. The clutch withdrawal bearing, specially designed for clutch throwout duties, serves as a considerable improvement on the flat thrust washer and deep groove types previously employed for this operation. It is of angular contact design, highly suited to 100 per cent. thrust loading. The outer race is provided with an integral deep face for contact with the clutch operating fingers, and a steel shroud totally seals the bearing, denying the ingress of foreign matter and permitting better lubrication.

The water pump spindle series of bearings considerably simplifies the mounting of the automobile fan and pump inasmuch as the shaft and bearing outer race is made in one integral assembly.

The inner tracks of the two ball races are formed on the spindle itself, which is in turn accurately ground for its entire length. This makes possible a bearing having a considerably less outside diameter and eliminates the necessity for inner races. To each end of the outer race is fitted a bearing seal, giving a rubbing contact on the spindle diameter. These seals prevent the ingress of foreign matter and at the same time the egress of grease from the bearing. When the bearing is initially fitted up it is charged with a supply of lubricant which is sufficient for the entire life of the bearing, thus eliminating any necessity for a grease nipple.

To Fight Fire at Sea

The Royal Danish Navy has placed its first order for pressure charge operated Nu-Swift extinguishers. This is the fifteenth Navy to install this particular equipment.

Wrapped in plastic bags, the turkeys are transferred to the Blackwood cold store, holding 6,000 birds, and maintained at −5°F. Frozen birds are then sent to London.

Turkey Production at Blackwood

The development of large turkey breeding and rearing units is taking place on Scottish farms. Although few in numbers, these farms are handling a considerable flow of birds and are now organised on mass production and disposal lines. An example of this is the work done at Blackwood, Auldgirth, Dumfriesshire, where turkey production is concentrated on the smaller white Beltsvilles, the aim being to produce a 12 lb. bird. Hatching capacity is about 3,000 eggs per week; chicks are hatched for the estate's own needs and also for sale, a policy which the larger breeding and rearing farms now generally follow.

To house the expanded numbers a new intensive-type house is to be built which will substantially increase the scope of the hatchery. Birds are transferred as "growers" either to verandahs at Blackwood or to turkey barns, holding some 6,000 birds, at The Cairn, another farm on the estate. The verandahs are slat-floored, slat-sided elevated houses each housing 100 growers.

Also at The Cairn is a new broiler house, 190 ft. long by 18 ft. wide, used for the production of table birds. How far this section of the scheme will develop remains to be seen; the economics of broiler production will decide.

A new wax plucking house has been built at The Cairn where birds are de-feathered by plunging into boiling wax, then cooled and stripped. Wrapped in plastic bags, the turkeys are then transferred to the Blackwood cold store, holding 6,000 birds, and maintained at −5 F. By installing refrigerated space, this estate has created a buffer between lower prices and their essential level of killings. The frozen birds are then transferred to a London distribution centre.

The estate has had its own 400 bird refrigerated container built to take the turkeys south to market.

New Headquarters Opened

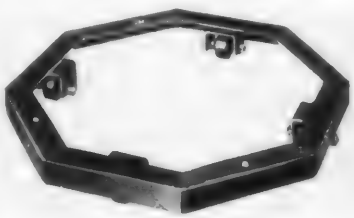
Several hundred architects, surveyors, and builders attended the reception marking the official opening of Semtex House, the new headquarters of the 19 branches in this country and the overseas activities of Semtex Ltd.

In the exhibition which followed, members of the Semtex design service were seen at work on actual designs; operatives laying a sub-floor compound over a rough concrete basis, installing Semastic decorative tiles, cleaning them with a polishing machine, laying a Dunlop rubber-designed floor, and installing a Fleximer jointless floor were also seen at work.

Bogie Trucks

An easily handled device, weighing only 11 lb. and capable of carrying loads up to 700 lb., has been developed by Powell and Co.

The frame is of welded steel, its octagonal construction giving great strength and rigidity. Four double ball bearing wheels are fitted so that, when loaded, the truck is extremely mobile and heavy loads are easily handled.

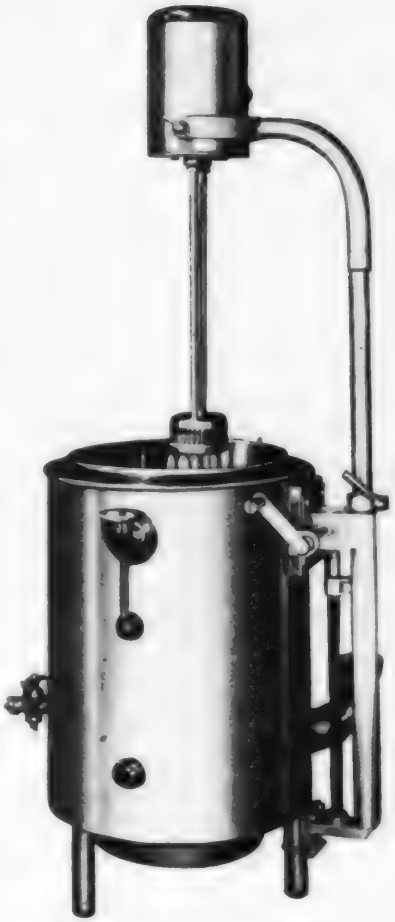


A bogie truck, weighing only 11 lb., for carrying loads up to 700 lb.

The wheels are on two planes and the truck revolves freely on the centre wheels so that it is particularly useful in congested spaces. It can also be permanently screwed to the bottom of bins, tea chests, and boxes to make a cheap but sturdy little truck for handling loose components, powders, etc.

Four Processes in One Vessel

Capable of heat-treating, emulsifying, cooling, and cold storing down to 35°F. a wide variety of liquids all in a single vat, the Pastomix, made by T. Giusti and Son, can be used for processing such foods as milk, ice cream mixes, and synthetic creams, the liquid being retained in a single container throughout the whole process.



The Pastomix is available in 25, 50, and 100 gallon capacities.

The three alternative methods of heating are gas, steam, or electricity, each through a water jacket to any temperature up to 200°F. Emulsifying and mixing is carried out by the in-vat Emulsor driven direct by a 1 h.p. or 2 h.p. motor (according to the size of the vessel) and quickly lowered into or raised from the liquid by a simple hand lifting gear.

Liquids can be cooled to within 10°F. of mains temperature by circulation of water in the jacket. If further cooling of the liquid is needed, this is achieved by means of a refrigerating coil, operated by a separate condensing unit.

The coil will bring the liquid to any desired temperature down to 35°F. For cold storing within close limits of temperature, a thermostat or pressurestat is used.

Available in 25, 50, and 100 gallon capacities, the Pastomix is supplied complete with indicating thermometer, water circulating and drainage valves, and level gauge.

Alternative refrigerating coils are available for use with direct expansion refrigerants like methyl chloride and Arcton, or for circulation of brine or chilled water.

Wheat Starch Production

Founded 18 years ago to process wheat starch resulting from the production of Energen starch-reduced dietary foods, Nutregen Ltd. has recently acquired larger premises at Ashford, Kent, where the latest refining and drying plant has been installed. The object has been to shorten the process time so as to reduce fermentation to a minimum. Dry starch is now produced less than four hours after water is added to the flour.

The refining process includes wet screening through 200 stainless steel mesh, the removal of all coarse fibre and suspended protein, followed by concentration and washing in high speed centrifuges. No preservatives or chemicals are used.

The starch is dried pneumatically or on hot rollers depending on whether a raw or gelatinised product is required; in either case drying is a matter of seconds.

Nutregen raw wheat starch is used extensively for textiles, foodstuffs, and laundry work. Gelatinised starch, thickening to a paste in cold water, is used as an adhesive, for foundry core binding, and some special food purposes.

Increasing Output of Steam Plant

A number of suggestions for improving output performance of process steam plant without involving expensive additions or alterations have been prepared by Spirax-Sarco.

An effective way of speeding the heat round the system is to get the air out of the steam mains quickly; this can be achieved by fitting an automatic air vent at the ends of the mains.

The best rate of output from process heating units cannot be attained unless the steam supply is clean and dry. It is necessary to assure mains drainage of condensate and priming water through ample collecting pockets with steam traps of the right type and capacity, and to remove the water which is in suspension in the steam. This cannot be done by the ordinary mains drainage arrangements and steam separators should be fitted at strategic points.

Five suggestions are given for speeding warming-up: (i) improvement of steam mains drainage; (ii) the supply of drier steam to units by fitting small steam separators at inlets to large machines or on branches to groups of small units; (iii) the use of thermostatic vents to ensure rapid discharge of air ahead of the steam; (iv) the discharge of the condensate by the steam traps, on all units, at the rate required by each job; (v) the avoidance of high lifts of condensate directly from steam traps.

For the great majority of processes, thermostatic control of the steam supply is more efficient and cheaper than hand valving. Comparatively inexpensive thermostatic control apparatus of the self-operating, direct-acting kind is available for a wide variety of heating and cooling processes operating at temperatures up to about 300° F.

Heat from the steam should be able to get to the process as rapidly and uniformly as possible by reducing to a minimum the insulating films of water and air on the condensing surfaces.

More efficient air venting will produce a higher effective steam temperature without having to increase steam pressure; the rate and uniformity of transmitting heat from the steam to the process are also greatly improved.

Periodical waterlogging and partial waterlogging can always be prevented by ensuring that each unit has its right type and size of steam trap and that the trap is fitted in the right position.

If condensate is lifted to a higher level directly from steam traps, there may be occasions when the pressure available at the traps is insufficient to lift the condensate the required height. To avoid lifting trouble and consequent waterlogging, the steam traps should be connected to a vented receiver and lifting can be achieved from there by means of a simple automatic pump.

Rejects and re-processing time may be caused by erratic temperatures at the process units or uneven temperatures across the heating surfaces, arising out of poor steam quality and inadequate steam trapping and air venting arrangements on the process units. Output lost in that way can be just as easily gained.

One way of easing recurring peak steam demands is to improve heating efficiency of the steam-using units and the methods of utilising process steam, so as to make possible a better all-round output performance per lb. of steam drawn from the boilers.

New Swindon Ice Cream Depot

The first industrial building on the new Swindon Corporation Trading Estate at Moredon is now in operation, following the opening of Wall's Swindon ice cream supply depot. The new depot, equipped with the latest type of cold store, will serve an area with an estimated population of 140,000.

With a capacity of over 7,000 gallons of ice cream, approximately 350,000 tubs or brickettes, the cold store will be kept at −15°F.

The cold store is operated by two Lightfoot vertical twin-cylinder compressors, thermostatically controlled and with water-cooled condensers. The compressors are controlled in steps so that the second unit comes into operation about 30 seconds after the first, thus reducing the starting current. They are, however, interlocked electrically and thermostatically and either can be used as an individual unit. Refrigeration is by means of Arcton 6.

A water-cooling tower brings down the temperature of the water after it has been used to draw the heat from the gas. This tower is fitted with an electric fan to give high-velocity air flow.

An unusual feature of the cold store is the fitting of thermostatically controlled heater gaskets to the doors to prevent their becoming frozen up.

Food in India

The book "Food Administration in India, 1939-47," by Sir Henry Knight, K.C.S.I., C.I.E., a review of which was published on page 222 of the June, 1954, issue of FOOD MANUFACTURE, can now be obtained from Geoffrey Cumberlege at 60s.

Rigid Box and Carton Contest

The rigid box and carton industry of Great Britain, represented by the British Paper Box Federation and the British Carton Association, are again organising a contest to decide the best boxes produced under several sections and classifications based principally on the lines of the 1953 contest.

Entries for the competition will be required during the period October 1 to 30, 1954. Judging will take place in November and it is hoped to exhibit all the entries at the National Packaging Exhibition at Olympia in January, 1955.

Bread without Agene

Research work at the Scottish School of Bakery, Royal Technical College, Glasgow, under Prof. J. P. Todd and in co-operation with Beattie's Bakeries, Glasgow, has been carried out to evolve a process eliminating the use of agene in flour for commercial breadmaking.

Beattie's have already done considerable work on the high speed flour-and-water batter process evolved by the Rank chemists and have had bread baked by this process for some considerable time. The research work at the College has sought to investigate in detail the processes at work; they proved that the success of this technique derived largely from the increased availability of atmospheric oxygen achieved in the high-speed mixing. Using the sealed Duplex equipment in which slow-moving arms rotate within the chamber, oxygen can be introduced easily and cheaply.

The development of effective equipment to allow conversion of the present open type mixers is to follow.

F.M.S. Bulletin

Compiled over a period of 18 months, the latest edition of the F.M.S. Bulletin contains news items relating to the activities of the parent company and their two subsidiary companies, F.M.S. (Farm Supplies), and F.M.S. (Farm Products), in U.S.A., France, Italy, Belgium, Belgian Congo, Southern Rhodesia, and Australia. Fully illustrated throughout, the Bulletin comprises interesting reading for agriculturalists, dairy farmers, and nutrition experts.

Millionth Dollar Celebration

Lord Mancroft was among those present on the occasion of the opening of the new London offices of George W. Horner Ltd. at 117, Regent Street and the celebration of the firm's millionth pound and millionth dollar's worth of exports. When Mr. G. Kenneth Horner inherited the business six years ago at the age of 22, its total exports to all markets amounted to less than £500 a year.

Mr. Horner believes that his success is largely due to concentrating on what he calls "the three P's without which Britain cannot hope to hold her own in export markets—price, packing, and pleasing the customer."

Modernisation at Horner's factory has included the installation of a conveyor belt system, and the bulk handling of sugar, milk, and glucose, resulting in considerable savings in cost with the highest possible degree of hygiene. In addition, extensive use is made of two-way radio for controlling internal transport in the five-acre factory, and delivery vehicles in the district.

The evolution of the Benger pack. From left to right is shown the label in use at the beginning of the century, the same plus the outer cover, label in use from 1939 to 1949, label in use from 1949 to the present day, and the present-day label, incorporating a new selling point—the use of Benger's as a nightcap.

Changes of Address

The address of the Food Manufacturers' Federation Incorporated is now 4, Lygon Place, London, S.W.1 (Telephone: SLOane 6146/7, 0631/2, 6752).

*

The Head Office of John R. Sorensen and Co. has now been removed to their new works extension at Soreen Buildings, 42, Raby Street, Manchester, 16 (Telephone: MOSs Side 2054, Telegrams: Rahbek Manchester).

A new label has been produced by Maconochie for their 1954 pack of fresh garden peas. This label incorporates the company's diamond design with a traditional background.

ERECTIONS AND EXTENSIONS

Increased business and the resulting expanding factory requirements have compelled Honeywell-Brown to establish an additional Glasgow office at 26, Blythswood Square, Glasgow. Mr. D. J. Venning has been appointed district supervisor in charge of the office.

*

Plans have been drawn up for J. Lyons and Co. for the construction of a new distribution depot on a site in Thornes Road, Wakefield, Yorks.

Refrigeration and Brewing

The transport and storage of liquid carbon dioxide in bulk at low temperature will be the main theme at The Carbon Dioxide Company's stand at the Brewers' and Allied Traders' Exhibition.

Complete with an actual refrigerating unit, automatic controls, and valves, the main exhibit will consist of the standard five to six ton storage tank as supplied and installed by the company.

Small 1½ ton storage tanks are available, operating under the same conditions as the larger tanks and offering the same advantages to the smaller user.

Inset into the walls of the stand will be other displays showing the road tank wagons now operated throughout the country for servicing the bulk storage tanks, and various items of ancillary equipment for special applications of carbon dioxide.

Chocolate Milk

A sterilised, ready-to-drink chocolate milk, marketed under the name Chilk, is being produced by The Chocolate Milk Co. Packed in one-third pint bottles or half-pint cans, Chilk has a solids content of 21 per cent. and retains its flavour indefinitely without refrigeration.

The company are the exclusive licensees of a Continental manufacturer, whose product, Chocla, is now made in Holland, Belgium, France, and Italy.

COMPANY NEWS

In February, 1947, the share capital of G. J. Worssam and Son was acquired by Vickers-Armstrongs. This step was taken to enable manufacturing capacity and the programme for research and development to be expanded by the use of the facilities available at the Crayford Works of that company.

This arrangement has proved very successful and over the last seven years G. J. Worssam and Son have been closely associated with Vickers-Armstrongs in the manufacture and design of their products.

It has become apparent, however, that the organisation could be simplified and its efficiency thereby increased; to this end it has been decided that such products should be sold direct by Vickers-Armstrongs. Accordingly, arrangements have been completed for that company to acquire the business of G. J. Worssam and Son as a going concern as from July 1, 1954.

▪

At the fifty-fifth annual general meeting of Cadbury Bros., Mr. L. J. Cadbury, the chairman, said that consumption of chocolate currently showed a substantial increase over pre-war figures. Consumption per head per week in January, 1953, was rather less than 6 oz. Immediately on de-rationing in February of that year, it jumped to between 9 and 10 oz., and though there was some easing of demand in the summer months, sales in the fourth quarter again rose to the 9-10 oz. level owing to the unprecedented demand for Christmas boxes. The present level was just over 8½ oz. per head per week.

On the related questions of prices and supplies, Mr. Cadbury pointed out that the company had planned to make some price reductions in the spring, but the increase in the price of raw cocoa had made this impossible. The overriding fact was that world demand had outstripped world supplies. The final outcome had been that the fantastic price of £575 a ton had been reached recently, though little business had been transacted at that figure.

On the prospects for future supplies, Mr. Cadbury said that the world's crop last year was about 735,000 tons. It was estimated that each year on average 70,000 tons were lost through capsid disease, 50,000 tons through black pod, and 50,000 tons from the continuing results of swollen shoot. Success in reducing these losses would clearly help the supply situation, and swollen shoot was now at least under control.

Meanwhile, world-wide surveys were being made of all the possible cocoa-growing areas. The venture with which they were associated in Malaya was now progressing after many delays, and experimental cocoa plots were planted in 1947-1948. These proved that cocoa production was likely to be successful in Malaya, but that special planting techniques were called for.

The first small crop was expected in 1957, and the company hoped to expand the planted area by 100 acres a year for the next four years.

Supplies of milk had improved considerably during 1953, especially towards the end of the year. The milk intake for the year of the Cadbury factories in Britain was a record 33 million gallons. This allowed the company to make more Dairy Milk chocolate from full cream liquid milk than at any time since 1940, and to withdraw Blended Milk chocolate from sale.

OBITER DICTA

● Cocoa is a volatile commodity.—*Lord Rennell.*

● If I were to solve the sausage mystery I believe I should go down in history as a great man. — *Major Lloyd-George, Minister of Food.*

● A meal should be not only a physical restoration but an intellectual relaxation. — *Dr. D. C. Childs, chairman of the New Zealand Wine and Food Society.*

● Everybody's bread in America is the best, most nourishing, contains most vitamins; in fact it is almost a marvel that Americans eat anything else but bread.—*A. V. Baker, writing in the "British Baker."*

● America, the richest country in the world, has the worst food of all. It's all processed and full of preservatives, dyes, and D.D.T. The average American walks around crazy with poison.—*Miss Gloria Swanson.*

● Some very formidable-looking pieces of apparatus will take the top off any can that was ever made with the same sort of nonchalance as a 100-ton press when cracking the proverbial nut.—*"Metalia," writing in "Canning and Packing."*

● These two industries have been long associated departmentally and, after all, there are many ancient links between fish and chips.—*Sir Winston Churchill, rejecting a proposal to separate the Ministry of Agriculture from the Ministry of Fisheries.*

● As with most medieval dishes, it is the strange culinary language that makes their recipes sound so fierce; "Take a pyg, slay hym, smite hym in pieces and grynde hym to powder," says the recipe. You feel there is no future at all for that pyg.—*Dorothy Hartley, writing in the "Daily Telegraph."*

● Surely it is not in the public interest for them to be forced to buy only machine-made goods rendered uninteresting and insipid by being produced under operating theatre conditions and sold neatly sealed up in packets? — *Mr. B. J. Willis, speaking at the Scarborough conference of the National Association of Master Bakers.*

BOOKLETS RECEIVED

A new "photo" book, with text in English, French, and German, illustrating the purposes for which Hyfoama may be employed in the sugar confectionery industry has been produced by Lenderink and Co.

▪

To assist users in the selection of the most suitable alloy for their particular application, High Duty Alloys have prepared a brochure which includes technical data on Hiduminium sheet and plate.

▪

The experience of a quarter of a century spent in successfully equipping large scale tea services is discussed in a recent booklet entitled "Tea Please," published by Stotts of Oldham.

▪

To celebrate 50 years of manufacturing, Brook Motors have published a special commemoration issue of "The Brook" which features among its contents articles on half a century of electrical enginering and the evolution of the modern A.C. electric motor.

▪

Consisting basically of a driving end, tension end, and intermediate and leg units, the new Masterveyor unit band conveyor, fulfilling a wide range of handling requirements, is described in a leaflet issued by the manufacturers, A. L. Marshall (Carlton) Ltd.

▪

The range of chemicals produced by John and E. Sturge is described in the booklet "Sturge Products." It covers the various grades of precipitated calcium carbonates, giving their main characteristics and uses. The cosmetic grade of p.c.c. Aeromatt is also dealt with. Other products described in the booklet include pure alkaline earth compounds, citric acid, sodium citrate, sodium potassium tartrate, seidlitz powder, potassium bicarbonate, and Ergosterol Sturge. Each product is analysed and its various uses listed.

World Food News

FORTHCOMING EVENTS

Sugar Exhibition

The 3rd International Exhibition "Sugar" is to be held at Amsterdam from April 15 to 26, 1955.

*

Refrigeration Congress

The Ninth International Congress of Refrigeration is to be held in Paris from August 31 to September 15, 1955. Regulations concerning the presentation of papers can be obtained from the International Institute of Refrigeration, 177, Boulevard Malesherbes, Paris.

*

Chemical Engineering

The Congress of the European Federation for Chemical Engineering for 1955 will take place in Frankfurt-am-Main during the period May 14 to 21, 1955, on the occasion of the ACHEMA XI—Chemical Apparatus and Equipment Exhibition and Congress.

The Congress will be sponsored by the 19 technical and scientific societies from 11 European countries that form the European Federation for Chemical Engineering.

The latest and most important scientific discoveries and technical developments in the chemical engineering field will be described in a series of about 18 Plenary Lectures. In addition to this series, it is also intended that a number of single lectures on special subjects in the same fields will be delivered.

The programme of the Congress will be supplemented by a number of works visits and social functions.

OVERSEAS ENQUIRIES

Smoked Hams

Cecil deCordova and Co. would like to get in touch with a United Kingdom packer of smoked hams who wishes to secure representation in the Jamaican market.

Firms interested in this enquiry should write direct to Cecil deCordova and Co., 146, Harbour Street, Kingston, Jamaica, giving full details about their products, export prices c.i.f if possible, delivery dates, etc.

*

Fancy Food Specialities

Mr. B. Joel of Berto Fancy Food Products, 3213, N. Sheffield Avenue, Chicago 13, Illinois, has expressed interest in importing and wholesaling fancy food specialities and confectionery.

It is reported that Mr. Joel's firm handles food specialities only, most of them imported, and covers the five Mid-Western States, Illinois, Wisconsin, Indiana, Michigan, and Ohio. They are interested in specialised items only and would not wish to carry jams, marmalades, or biscuits, competition in which is keen both from American and imported sources. The only exception to this is that Mr. Joel might consider decorative tins of fancy biscuits, including cocktail assortments, etc., for the Christmas trade only. Any other food items, such as canned fish products or unusual fruits or vegetables, might be of interest as would quality confectionery including toffee and boiled sweets.

United Kingdom firms interested in this enquiry should write direct by air mail to Mr. B. Joel submitting full particulars of their products, together with trade literature and price lists. Prices should be quoted in dollars and cents c.i.f. United States port. The delivery position should also be stated.

*

Canned Foods

L. G. Carrion and Co., Hamburg 11, Gr. Johannisstrasse 13, wish to receive offers from British firms who would be able to supply them with South African rock lobster and canned colonial fruits, such as pineapples and peaches. They would be prepared to work as commission agents preferably on a c.i.f. basis.

The firm is run by Wilhelm Steckmest and was originally established in 1908. They deal mainly in various kinds of canned fish, particularly sardines. They also trade in Italian tomato ketchup and dried and canned fruits.

United Kingdom firms interested in this enquiry are asked to write direct to the Hamburg firm, giving details of prices, deliveries, and terms.

*

Containers and Filling Machines

The Northshore Dairies Ltd., 32, Market Street, Montego Bay, Jamaica, British West Indies, would like to contact United Kingdom manufacturers of wax cups and cardboard containers, in all sizes, for packaging milk and ice cream, and also a machine for filling and sealing the containers. The Jamaican firm are at present using bottles for milk and wish to change over to paper containers.

Manufacturers interested in this enquiry should write to Northshore Dairies Ltd., direct, submitting full details of the products offered, and quoting c.i.f. prices wherever possible.

*

Dough Mixing Machines

Tromp and Sons (Pty.) Limited, 91-93, Strand Street, Cape Town, are interested in the importation, on an exclusive franchise basis, of electrically operated dough mixing machines for bread, in capacity sizes of 20 to 50 lb.

Manufacturers interested in this enquiry should send full details, prices, and delivery dates direct to the Cape Town firm.

*

Biscuits and Sardines

Señor G. Rivas of Calle Emiliano Tejera No. 13 (P.O. Box 563) Ciudad Trujillo, Dominican Republic, has advised the British Embassy at Ciudad Trujillo that he wishes to represent, on a commission basis only, a United Kingdom manufacturer of biscuits, and an exporter of sardines.

Firms interested in this export opportunity should write, by air mail, to Señor G. Rivas, giving full details of the products offered and an indication of agency terms. Prices should be quoted in U.S. dollars and cents c.i.f. Ciudad Trujillo. The delivery position should also be stated.

*

Food Delicacies and Specialities

The Angostura-Wuppermann Corporation, of 137, Chambers Street, New York 7, N.Y., have informed the British Consulate-General in New York that they would be interested in importing from the United Kingdom food delicacies or specialities that have possibilities for sales in the better type grocery and delicatessen stores and in large super-markets. They would prefer an exclusive sales agency. If this is not possible they would buy direct for their own account and not act as commission agents.

Manufacturers interested in this enquiry should communicate by air mail with Mr. A. B. La Far at the New York address, forwarding dollar prices c.i.f., delivery dates, type and method of packing, etc.

*

Confectionery

European Import Co., distributors of fine foods, of 910, Preston Avenue, Houston, Texas, wish to represent United Kingdom shippers of toffees, etc. European Imports Co. are interested in offers only from those firms who do not have sole agents in the U.S.A., and who would be prepared to grant them sole representation for the State of Texas. The toffees should be packed in decorated tins, weighing 4, 6, 8, and 16 oz.

United Kingdom concerns interested in this enquiry should communicate with Mr. Antone of the United States firm, by air mail, sending quotations in dollars c.i.f. Houston, literature, and securely packed samples.

A modern layout for the preparation of tomato purée recently installed in the factory of Industrias de Alimentação Idal at Vila Franca de Xira, Portugal. The centre item is a thermo-compressor linked up with four vacuum pans.

A Four-day Mushroom

Syracuse scientists have grown in four days, by artificial methods, the rare mushroom *Morchella hortensis*; with the right climatic conditions, the mushroom normally takes one year to produce.

The initial batch of mushrooms takes 10 days to develop, but after that every time a mushroom ball is chopped up and put into a sterile solution containing nutrients, thousands of other pea-sized pellets appear in about four days.

Plans have already been made to freeze dry the mushroom and convert it into a seasoning for use on steaks and in soups and other dishes.

International Vitamin Commission

To provide standardisation in the vitamin assay of foods in various countries and thus to facilitate international trade, a Vitamin Commission has been organised under the auspices of the Food Division of the International Union of Pure and Applied Chemistry with Prof. E. Brunius, of the National Public Health Institute, Stockholm, Sweden, as chairman. The additional members are:

Dr. W. F. G. Cuthbertson (Glaxo Laboratories, England);
Dr. Max Kofler (F. Hoffmann-La Roche and Co., Switzerland);
Dr. Bernard L. Oser (Food Research Laboratories, United States);
Dr. Henri Simonnet (National Veterinary School and National Agronomic Institute, France).

The Commission will explore vitamin procedures specifically adapted to food products entering into international commerce. Thus medicinal vitamin preparations, such as are at present included in the national and international pharmacopoeias, will not be included. Examples of foods sold for their vitamin content are dried yeasts, wheat germ oil, marine liver oils, leaf meals, rose hips, and certain concentrates of vitamins A, D, E, B_{12}, and carotene. The nutritional and economic value of many foods in addition to these are controlled in part by their vitamin content.

The Commission will attempt to utilise the standardised methods of the numerous organisations within several countries that have engaged in standardisation work and to integrate and adapt these methods for use at an international level.

Award for N.Z. Butter

Butter produced by the two New Zealand factories equipped with the new APV cream treatment units has scored outstanding successes at the Waikato Winter Show. The Cambridge Co-operative Dairy Co. of Hautapu, Cambridge, and the New Zealand Co-op. Dairy Co. of Tirau have each won six places in the butter classes and the Cambridge factory has won the Open Championship—the supreme award for butter in New Zealand.

Canned Meals

Compared with last year, one-third more canned fruit and vegetables and twice as many pickled foods have been put on the market by the Czechoslovak Fruta food processing plant.

The factory is now also producing 30 different canned whole dishes, among them smoked pork with puréed peas, cauliflower with ham, risotto of veal with rice and mushrooms, and veal kidneys with rice and peas.

The special light blended Irish whiskey called Crock of Gold, produced by W. and A. Gilbey of Dublin for export to America, is bottled in a book flask. Covering the whole bottle is a tweed bag of Irish hunting green and saffron with a booklet of cocktail recipes attached.

Irish Blackberry Juice for U.S.

A plant for the manufacture of concentrated blackberry juice for export to the United States is to be set up by the Dungarvan Co-operative Fruit Growers Society. During the season about 1,000 tons of blackberries will be purchased, from which some 45,000 gallons of concentrated juice will be extracted. Other fruit juices are also to be processed by the Society.

Another Irish juice processing firm, Tipperary Products, has already exported blackberry juice to the United States as a first step in the search for alternative markets, the trade with the U.K. having been reduced to a minimum.

This plant had been set up in conjunction with French and Dutch firms, but this season the Dutch machinery has been removed, the local firm having acquired new machinery to complete their plant and enable them to carry out the processing themselves in co-operation with Coras Trachtala Teo, the Republic's Government sponsored body responsible for the promotion of dollar exports.

Gallate Study Conference

Ten Swedish nutrition experts and chemists recently studied the subject of the protection of fats by means of gallate, following their acceptance of a joint invitation by the Netherlands Central Institute for Nutrition Research, T.N.O. and Naarden, to attend a three-day study conference.

In Sweden, where fat deterioration as a result of rancidity is regarded as a threat to economic stability and human health, members of the scientific staff of the *Svenska Institutet för Konserveringforskning*, together with representatives of the dairy and fat processing industries, immediately responded when the results of the research into octyl and dodecyl gallate were announced. As a result, Dr. Ir. F. D. Tollenaar (C.I.N.R., Utrecht) gave a lecture in Sweden on the latest developments in the field of antioxidants, and the Swedish food certification authorities decided to allow octyl and dodecyl gallate to be incorporated in edible fats.

The lectures given at the study conference were devoted to "The Chemistry and Pharmacology of Gallic Acid Esters" (A. H. Ruys), "Cold Storage Warehouse Defects of Butter" (Dr. Ir. F. D. Tollenaar), and "The Results of Swedish Research into the Advantages of Gallates" (Dr. Per Swartling). Dr. Swartling, a member of the staff of the State Dairy Research Station in Sweden, stated that detailed investigations had shown that the addition of approximately 30 mg. of dodecyl gallate to 1 kg. of fresh milk, prevented the appearance of defects, such as the oxidation taste, for a lengthy period of time.

Neither the food certifying authorities nor the public at large have raised any objection to this addition.

Fish Processing Plants in Poland

A new factory, capable of an output of 1,200 tons per year of commercial and medical cod liver oil, will come into production this year at Gdynia, the Polish port and fishing centre on the Baltic.

Other fish processing plants are in the course of construction at various places in the Baltic provinces of Poland; one at Gizycko will have an annual output of over 2,300 tons of fish products.

News from the Ministries

Imports of Maize Starch

Maize starch may now be imported from dollar countries under Open Individual Licences instead of under specific licences as hitherto.

Meat Imports

An Order has been made introducing some changes in the present regulations under the Diseases of Animals Act relating to the import of carcasses and other animal products. Designed to safeguard livestock in this country, the new regulations came into operation on July 3, 1954.

Under the new regulations there will be no veterinary restrictions on the landing in Great Britain of meat from Argentina, Australia, Brazil, Canada, Channel Islands, Chile, Falkland Islands, Finland, Iceland, Irish Republic, Isle of Man, New Zealand, Northern Ireland, Norway, Union of South Africa, and Uruguay.

From certain countries imports will be permitted subject to veterinary safeguards, and from the rest of the world imports of certain animal products only will be allowed.

Imported Margarine

The attention of importers and traders dealing in imported margarine is drawn to the Merchandise Marks (Imported Goods) No. 4 Order, 1939, made under the Merchandise Marks Act, 1926, which requires all imported margarine to bear an indication of origin.

It is essential that the requirements of the Order should be carefully observed, since any imported margarine which is not marked strictly in accordance with the terms of the Order is liable to be refused admittance into the United Kingdom by H.M. Customs and Excise.

Cheese from North America

A quota has now been arranged for the import of natural cheese from Canada and U.S.A. It is proposed to divide the quota among traders who imported cheese from North America during 1937-1938 and who paid the overseas supplier direct.

Anglo-Dutch Trade Talks Concluded

The United Kingdom and the Netherlands have completed discussions on arrangements for trade in 1954. The arrangements, which are concerned only with the small part of Anglo-Dutch trade still subject to bilateral quotas, provide mainly for imports of flower bulbs, confectionery, canned fruit, biscuits, and processed milk into the United Kingdom, and for imports of motor cars into the Netherlands.

Import Arrangements for Foodstuffs

Arrangements have been made for the import of certain kinds of foodstuffs from specified countries during the second half of 1954.

The licensing arrangements for the import of biscuits, chocolate and sugar confectionery, chocolate couverture, and canned and bottled fruit from Western Europe and certain other countries will be broadly similar to those already in existence for the current half-year.

The licensing arrangements for certain sugar products, including chocolate and caramel spread, honey cream spread, fruit juices, table jellies, custard, etc., powders, and flavoured syrups, will be the same as those for the current half-year.

Imports of Cream

Existing arrangements for importing cream from certain countries are to be extended until the end of the year.

These arrangements are briefly that cream may be imported from the sterling area without the need to obtain a separate import licence and from other countries (except the dollar area and Eastern Europe) under specific licence.

End of Food Control Committees

When food rationing was finally abolished on July 3, the work of Food Control Committees came to an end; the Food Control Committees (Constitution) Order has therefore been revoked.

For more than 14 years, these Committees have given invaluable assistance to successive Ministers of Food, and they have been a vital link between the Ministry, local government, the food trades, and the public.

Information and Advice

This Service is available to subscribers to FOOD MANUFACTURE. If a stamped addressed envelope is enclosed replies will be sent by post, but enquiries cannot be answered by telephone.

Marzipan Meal Substitute

B.7068. *We should be grateful for any information you can give us regarding a formula for a marzipan meal substitute, using apricot kernels as the base.* (Australia)

We think you must have in mind the product known as persipan. As apricot kernels contain amygdalin, the basis of bitter almond oil, the kernels must be treated with boiling water to hydrolyse this bitter component.

Basic Formula

	lb.	oz.
Apricot kernels	12	
Soya flour	3	
Almond oil		¼

First, the kernels are cleaned and all impurities eliminated. They are then placed in a steam jacketed pan and treated with boiling water for 30 minutes. The water is drained off and the process repeated. The kernels are blanched and placed on trays in a drying stove at 130° to 140°F. until quite dry, preferably overnight. This drying process expels the benzaldehyde and prussic acid contained in the kernels.

The kernels are then passed through an almond grinding machine, and the resultant meal mixed thoroughly with the soya flour and almond oil. It is allowed to remain in trays until ready for packing in moisture-proof containers.

Cream Filling for Wafer Biscuits

B.7094. *We have recently installed a new automatic plant for the production of cream filled wafer biscuits, and should be glad to have a formula for the manufacture of a suitable cream filling.* (Notts.)

The usual cream filling for wafer biscuits is as follows:

	lb.	oz.
Hardened palm kernel oil or coconut oil	60	
Pulverised sugar	65	
Tartaric acid		1¾
Flavour and colour as required.		

This formula should produce a light type of cream, but might be modified by using some softer fat. No soya, corn, or other flour should be used in the cream, as this would spoil the keeping qualities of the wafers.

Onions in Brine

B.7095. *We should be grateful if you could give us some information on the preparation of onions in brine.* (New Zealand)

The onions are first graded, this operation being followed by trimming, topping, and tailing. For brining without fermentation, the onions are packed fairly tightly into a cask and filled up with 85° brine. After 48 hours, the brine is run off and replaced with saturated brine. The onions are ready for use in about a fortnight.

For brining with fermentation, the onions should be soaked in water for two or three days, the water then being replaced by brine to give a salt concentration of 5 per cent., left for four or five days, then replaced with a 60° brine, this subsequently being strengthened up to 80° if the onions are to be kept for any length of time. Alternatively, the onions should be filled into a cask with 10 lb. of salt for every 100 lb. of onions and filled with an 85° brine. The cask is bunged and rolled to ensure even distribution. The brine is then strengthened gradually—set at the rate of 2° per week—until it reaches 60° or 80° according to the length of time the vegetables are to be held in store.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.7055. *Curry powder.* (Australia)
B.7056. *Butter and margarine literature.* (London)
B.7057. *Candied peel and glacé cherries.* (Italy)
B.7059. *Packaging film.* (Staffs.)
B.7060. *Soft drinks.* (Cornwall)
B.7061. *Lemon curd.* (London)
B.7062. *Corn syrup and mayonnaise.* (Uruguay)
B.7063. *Strawberry pulp preservative.* (London)
B.7064. *French mustard.* (Canada)
B.7066. *Sherbet powder.* (Ireland)
B.7070. *Flavours.* (Northumberland)
B.7072. *Phosphates.* (Belgium)
B.7073. *Preserves.* (Lancs.)
B.7074. *Eggcracking and separating equipment.* (Yorks.)
B.7076. *Drinking straws and wafer biscuits for ice cream.* (Lancs.)
B.7078. *Vinylite plastic containers.* (Somerset)
B.7079. *Colours for canned peas.* (Finland)
B.7082. *Edible casein powder.* (Lancs.)
B.7084. *Egg powder.* (India)
B.7086. *Meat pies.* (Lancs.)
B.7088. *Wire banding equipment and aluminium roller conveyors.* (Northants.)
B.7090. *Synthetic cream.* (Staffs.)
B.7091. *Fish filleting equipment.* (Australia)
B.7092. *Grated cheese.* (Lincs.)
B.7093. *Beetroot in vinegar.* (Glam.)
B.7096. *French mustard.* (Ireland)
B.7101. *Bandsaws.* (London)
B.7102. *Preservatives in sausages.* (Yorks.)
B.7103. *Fruit juice production.* (Ireland)
B.7104. *Dough dividers.* (Notts.)
B.7108. *Cocktail sausages.* (Yorks.)
B.7109. *Shrimp deveiner.* (London)
B.7112. *Protein extraction from green crops.* (Hereford)
B.7113. *Pectin production.* (Cambs.)
B.7115. *Wrapping machinery.* (London)
B.7116. *Washing equipment.* (Derbyshire)
B.7117. *Confectionery jars.* (Canada)
B.7122. *Gum tragacanth and acacia.* (Ireland)
B.7123. *Brown wrapping paper.* (Lancs.)
B.7124. *Lemonade powder.* (London)
B.7125. *Mould contamination of pies.* (Durham)
B.7126. *Moulds and depositors.* (Lancs.)
B.7127. *Glyceryl monostearate in bread.* (British West Indies)
B.7128. *Rotary can stuffers for corned beef.* (Australia)
B.7129. *Fish paste.* (South Africa)
B.7131. *Jar labelling equipment.* (Ireland)
B.7132. *Drum drier for sugar beet.* (S. Africa)
B.7133. *Coloured flavouring materials.* (Co. Durham)

Recent Patents

711,503. Soc. Anon. Holding Luxembourgeoise Inventa: Processes for the manufacture of glucose of increased purity.

711,831. Bamag, Ltd., and Manning, A. H.: Solvent extraction, particularly of oils, fats, and waxes, from organic materials.

711,869. Thiele, K.: Apparatus for baking wafers and the like.

712,048. Morgan, J. D. (Wiggins, L. F. and Davison, B. K.): Sugar cane wax.

712,402. S.B. Engineering Co., Ltd.: Manufacture of plastic material, such as ice cream.

712,420. Henkel, A.: Cookers for boiling sugar and like sweet substances for the production of confectionery.

712,435. Dittgen, J. K., and Carl, H.: Electrically heated apparatus for use in the baking of foodstuffs.

712,443. Jahn, R. C.: Machines for coating pastries or other confectionery with fondant or the like.

712,472. Brownlee, J. V.: Apparatus for breaking eggs and extracting the contents thereof.

712,479. A.P.V. Co., Ltd.: Treatment of cream.

712,521. Tweedy and Co., Ltd., G., and Brooks, E.: Potato slicing machine.

712,622. Entwistler Walker, Ltd.: Machines for the rolling of pastry into sheets.

712,632. Wright's Biscuits, Ltd.: Method of and apparatus for packing biscuits into tins and like containers.

712,834. Weir, Ltd., G. and J., and Hillier, H.: Evaporating plants.

712,842. Bingham, D. W.: Syruping apparatus for use in the canning of fruit.

712,883. Colgate-Palmolive-Peet Co.: Carbohydrate food products.

712,909. Eastwood, R. F.: Apparatus for the production of moulded ice cream confectionery.

713,031. Heinz Co., H. J.: Sterilising canned foods.

713,035. Miag Muehlenbau und Industrie Ges.: Process for conditioning wheat or like grain.

ABSTRACTS OF BRITISH PATENTS

Stabilisation of Chocolate

The discoloration of solid chocolate materials during storage is a matter of common experience. Chocolate bars and certain chocolate enrobed confections tend to fade and/or change in colour under certain conditions of storage and composition. This phenomenon is known as "bloom." It may be a "low temperature bloom" which is a grey to light brown hue, or a more pronounced, very tan discoloration known as "high temperature bloom" which occurs under extreme temperature variations rendering the chocolate "heat struck."

The physical or chemical nature of the change which accompanies this unsightly phenomenon is not known. The taste and technical requirements of the industry preclude any substantial modifications of the chocolate compositions as currently employed, but it has been discovered that by the incorporation of minor amounts of certain materials, the tendency to "grey" or "bloom" is greatly reduced without any other noticeable effect upon the appearance or taste of the unstabilised material.

706,506. *Atlas Powder Company.*

Coconut Products

A process is given for preparing coconut which is tender, resistant to microbiological spoilage, and relatively free from undesirable yellowing which comprises adding to the coconut a humectant from which carbonyl-containing impurities have been removed, the humectant consisting of propylene glycol or butylene glycol.

It has now been discovered that the yellowing or discoloration mentioned above is due to the presence of certain carbonyl-containing materials in the propylene glycol or butylene glycol added to the coconut, and that it can be substantially eliminated by separating or effectively removing such carbonyl-containing impurities from the glycols before adding them to the coconut.

708,845. *General Foods Corporation.*

Undenatured Gluten

This invention relates to the production of a solution of substantially undenatured gluten, which may be dried to give dry, finely divided substantially undenatured gluten, which is useful in improving the baking quality of flour.

The desired peptised colloidal solution of substantially undenatured gluten is obtained by dispersing with agitation the wet gluten-containing material, in the form of a doughy mass, in aqueous acid solution when the normality of the acid solution, before dispersion of the gluten therein, is between 0·015 and 0·005 N and the gluten solution formed has a *p*H of substantially 5·0 to 5·8. The concentration of the acid used and the *p*H of the gluten solution are critical and must be maintained within the limits stated if the desired peptised colloidal solution is to be obtained. The amount of gluten in the dispersion is also important. Acetic acid solution is the preferred dispersing agent, but solutions of other volatile acids, such as hydrochloric and lactic, may be used. Agitation of the gluten in the dilute acid is essential to obtain a colloidal peptised gluten solution in accordance with the invention. A colloid mill may be used.

708,806. *The Honorary Advisory Council for Scientific and Industrial Research.*

Machines for Mixing Batter

The object of the present invention is to provide a novel construction of mixing machine, the construction being such that mixed material may be removed through the base of the hopper in which the materials are mixed.

The machine comprises a fixedly mounted hopper which accommodates at least one rotary beater at or near the bottom thereof and at least one other rotary beater, the beaters being mounted on horizontal parallel axes so that the lowest sweep of the beater members of the second mentioned beater is at a higher level than the axis of the first mentioned beater. The base of the hopper is provided with a discharge opening closed by a door or the like controlled by a mechanism which is so constructed that upon operation the door moves first in a direction normal to its plane of closure and then laterally with respect thereto so as to leave the discharge opening substantially unobstructed.

710,299. *Morton Machine Co., Ltd., William Thomson, Raymond Christian Leith, and Robert Hepburn.*

British patents and trade marks have been selected from the "Official Journal of Patents" and the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

Preservation of Fruit and Vegetables

A thorough survey of the conditions of storage and use of fruit and vegetables has led to a proposal which ensures the preservation of comestibles, especially of fruit and vegetables, in their natural state for a considerable length of time and at a relatively low cost. Moreover, this new method does not necessitate complicated and costly machinery and apparatus.

The comestibles are stored in the air spaces of containers submerged in water, so that the air is compressed therein by hydrostatic pressure. Such containers may be built on the principle of a diving bell, wherein the air is not only compressed, but is also saturated with water vapour. In storage rooms at a depth of 10 to 20 metres below the level of the sea or a lake the temperature is also lower than in the open air and so provides an additional factor which is beneficial for the preservation of comestibles.

710,979. *Bezalel Niedzwiedz.*

Machines for Moulding Pastry

This invention is concerned with machines for the moulding of pastry, dough, and like plastic materials, and while applicable to the moulding of pie cases (for meat pies and the like) in which connexion the machines are sometimes known as pie-blocking machines, it is primarily intended for the moulding of the pastry portion of small tarts.

It provides simplified and more readily-operable forms of machine, in which, at the completion of the moulding and trimming operations, the pastry (with the tray in which it is shaped) is detached automatically from the dies.

709,641. *Charles Edwin Cox.*

ABSTRACTS OF FOREIGN PATENTS

Bacon Cutter

A bacon-cutting machine is described in which the bacon is cut by rotating circular blades in the longitudinal direction, by flat blades moving to and fro in the horizontal direction, and by a wheel knife in the transverse direction. The horizontally movable frame carrying the flat blade is driven by an eccentric disposed in a gear-wheel.

German 877,420. *Münzenmaier.*

Handling Sliced Food

A method is described of producing a bundle of slabs of food with portions of divider material between the slabs from a block composed of a plurality of slabs and also for moving the end slab away from the remainder of the block by blowing a blast of liquid along the line of juncture between them.

U.S. Patent 2,667,420. *B. E. Meulemans and W. A. Nelson.*

Trade Marks

CHOC - O - MELS.—710,176. Non-medicated sugar confectionery containing or covered with chocolate. **H. S. Whiteside and Company, Limited,** Parkhouse Works, Parkhouse Street, Camberwell, London, S.E.5; Manufacturers and Merchants.

DANDY.—717,945. Colouring matters for food, all for sale in Scotland. **David Wight and Company, Limited,** 30, Clyde Place, Glasgow, C.5; Merchants.

KOSAN.—720,320. Installations for lighting, heating, steam generating, cooking, refrigeration, drying, ventilating, water supply, and sanitary purposes; and parts of and fittings for all the aforementioned goods. **A/S Kosangas** (a Company incorporated under the laws of Denmark), Vesterbrogade 10, Copenhagen V, Denmark; Manufacturers.

ERA.—714,045. Meat and game (other than live game). **Vacuum Foods, Limited,** 10, Eastcheap, London, E.C.3; Merchants.

VERTEX.—724,772. Mixing machines. **George Joseph Thordahl,** trading as **G. J. Thordahl and Company,** Welsh Cross Roads, Ledsham, Wirral; Manufacturer.

HARMIL KISS-KRUST.—726,267. Bread, cakes, pastry, meat pies, and non-medicated sugar and flour confectionery. **Harmil Bakeries, Limited,** Longton, Stoke-on-Trent, Staffordshire; Bakers.

TRAVALOLLI.—726,449. Non-medicated sugar confectionery. **Stanley Z. Jackson (Chemists), Limited,** 129, Carlton Street, Castleford, Yorkshire; Manufacturers and Merchants.

PERMICOL.—726,592. Colouring matters for food. **W. J. Bush and Company, Limited,** 28, Ash Grove, Hackney, London, E.8; Chemical Manufacturers.

SUNSHINE.—726,689. Gelatine powder (for food). **P. Leiner and Sons, Limited,** 7 and 9, Creechurch Lane, London, E.C.3; Manufacturers.

NEVIS.—726,793. Edible oils and fats. **The British Margarine Company, Limited,** Central House, 46-47, Finsbury Square, London, E.C.2; Manufacturers.

QUICKLAC.—726,831. Milk and dairy products (for food). **Milk and Cocoa Products, Limited,** 84, Brook Street, London, W.1; Merchants.

LUMIERE.—727,001. Fish (except live fish) and foods prepared therefrom. **Silvas, Coelhos, Limitada** (a Joint Stock Company organised and existing under the laws of Portugal), Rua General Gomes Freire, 85 to 93, Setubal, Portugal; Food Canners and Merchants.

KOVOD.—727,016. Margarine and dairy products (for food). **M. Boxer and Sons, Limited,** 57-59, Commercial Street, London, E.1; Manufacturers.

MEDDOCAKE.—727,200. Biscuits (other than biscuits for animals), non-medicated confectionery, ice cream, and ice cream powder. **Meddocream, Limited,** Old Bromford Lane, Ward End, Birmingham, 8; Manufacturers and Merchants.

GREENSLEEVES.—727,264. Edible oils and edible fats. **Benninga (Mitcham), Limited,** 33, Mortimer Road, Mitcham, Surrey; Manufacturers.

SCAN.—727,268. Meat and meat products (for food). **Scan, Foreningen Skanska Andelsslakterier U.P.A.** (a Body Corporate organised under the laws of Sweden), Rundelen 3, Malmo, Sweden; Manufacturers and Merchants.

PAVILION.—727,326. Non-medicated confectionery. **Clarnico, Limited,** Clarnico Confectionery Works, Wallis Road, Victoria Park, London, E.9; Manufacturers.

GIESTAL.—727,337. Preserved fish. **B. J. Borges, Limitada** (a Joint Stock Company organised under the laws of Portugal); Manufacturers and Merchants.

SUNNY GRAIN.—727,505. Biscuits (other than biscuits for animals). **Brookes Biscuit Company, Limited,** Skerton Road, Old Trafford, Manchester, 16; Biscuit Manufacturers.

ORANLADE. — 727,516. Marmalades. **Solo Orchards, Limited,** Totteridge Lane, London, N.20; Merchants and Manufacturers.

MAGPIE BRAND.—727,521. Jams, jellies (for food), marmalade, canned fruits, canned vegetables, mincemeat, and lemon curd. **Chivers and Sons, Limited,** The Orchard Factory, Cambridge Road, Histon, Cambridge; Manufacturers.

BLOOMFIX.—727,672. Seasonings. **T. Lucas and Company, Limited,** "Ruskit" Mills, Moravian Road, Kingswood, Bristol; Manufacturers.

WILLOW BRAND.—727,748. Bacon, hams, butter, lard (for use as food), cheese, and margarine. **W. H. Tutton and Company, Limited,** 14, Fennel Street, Manchester, 4; Provision Merchants.

PEELERS.—727,804. Meat products (for food for human consumption). **T. Wall and Sons, Limited,** "The Friary," Friars Place Lane, Acton, London, W.3; Manufacturers.

SPACE BAR.—727,845. Biscuits (other than biscuits for animals) and flour confectionery, all in the form of bars. **The International Biscuit Company, Limited,** Progress Works, Ayres Road, Old Trafford, Manchester, 16; Manufacturers.

CERAMIN.—728,072. Fruit juices containing amines. **Ceres Fruit Juices and Vitamin Company (Pty.), Limited** (a Joint Stock Company organised under the laws of the Union of South Africa), Little Prussia, Ceres, Cape Province, Union of South Africa; Manufacturers.

New Companies

L. Oks and Company (Produce), Limited. (531622.) To carry on business of manufacturers of and dealers in cocoa and coffee beans, oilcakes, and oilseeds. Nom. cap.: £10,000 in £1 shares. Dirs.: to be appointed by subs. Subs.: Kathleen Murphy (secy.), 58, Spital Street, Dartford, Kent, and Rosalind Reeves (secy.), 45, Hamilton Avenue, Tolworth, Surbiton, Surrey.

Denbrooks, Limited. (532522.) To carry on business of confectioners, sugar boilers, mineral and aerated water manufacturers. Nom. cap.: £1,000 in £1 shares. Dirs.: A. B. Fulbrook, 226, Hamilton Avenue, North Cheam, Surrey; C. C. Fulbrook, 155, St. Pauls Wood Hill, Orpington, Kent, and C. K. Dent, 6, Rosary Gardens, London, S.W.7.

Adams Cheese, Limited. (532703.) Buxton Road, Leek, Staffs. To carry on business of manufacturers of and dealers in cheese, bacon, and lard. Nom. cap.: £6,000 in £1 shares. Dirs.: F. Adams, senr., Adamshill, Buxton Road, Leek; F. Adams, junr., Springhill House, Buxton Road, Leek, and J. H. Adams, Sunnyside, Daintry Street, Leek.

Pascoe - Rutter Vitamins, Limited. (532832.) To acquire the process of manufacturing and the right to manufacture and deal in chemical, medicinal, and pharmaceutical preparations and to carry on business of druggists, chemical, and vitamin manufacturers. Nom. cap.: £2,500 in £1 shares. Dirs.: R. Pascoe-Rutter (mang. dir.), Bradewick, Thorpe le Soken, Essex; P. J. S. Dredge, 1, Wensley Drive, Leeds, 7, and Miss E. M. Chenery, address not stated.

W. G. Barratt and Sons (Vianda), Limited. (533212.) 104, Great Russell Street, London, W.C.1. To carry on business of importers, exporters, and manufacturers of and dealers in foodstuffs. Nom. cap.: £1,000 in £1 shares. Dirs.: W. G. Barratt and Mrs. H. Barratt, 104, Forest Glade, London, E.4; Hugo C. Van Odyck, and L. A. Wouters.

Kouwenberg (London), Limited. (533183.) 18, Queen Anne Street, Harley Street, London, W.1. To carry on business of importers, brokers, manufacturers, preservers, canners, and packers of and dealers in meat and meat products, game, fruit, and vegetables. Nom. cap.: £100 in £1 shares. Dirs.: J. M. Kouwenberg, Willem III Laan 9, Breda, Holland, and G. R. Fraser, 24, Oakdale Road, Finsbury Park, London, N.4.

British Packet Cheese Company, Limited. (533332.) To carry on business of manufacturers of and dealers in provisions and foodstuffs, including in particular cheese, butter, and milk. Nom. cap.: £1,000 in £1 shares. Dirs.: not named. Subs.: A. G. Maby and G. P. G. McNair (solrs.), 5, Thavies Inn, E.C.1.

Crumbie Sales Agency, Limited. (533334.) 215, High Street, Orpington, Kent. To carry on business of manufacturers' agents, dealers in and manufacturers of sugar and general sweetmeats, chocolate and confectionery of all kinds, flour, cakes, biscuits, aerated water, wines, and spirits. Nom. cap.: £1,000 in £1 shares. Dirs.: R. N. Crumbie, 57, Bassetts Way Farnborough, Kent, and Rear Admiral W. D. T. Morrish, C.B.E. (retd.), Orchard Cottage, Elm Walk, Farnborough, Kent.

Johnson (Cardiff), Limited. (533354.) 176, Clive Street, Grangetown, Cardiff. To carry on business of manufacturing confectioners, and sugar boilers and manufacturers. Nom. cap.: £25,000 in £1 shares. Dirs.: H. C. K. Johnson and Grace Davies, Dunoon, Lon-y-dderwen, Rhiwbina, Cardiff.

Rathbone Brothers, Limited. (533594.) Central Bakery, Winstanley Street, Newtown, Wigan. To carry on business of bakers, pastrycooks, flour millers, manufacturers of and dealers in bread, biscuits, cakes, chocolates, sweets, and jams. Nom. cap.: £75,000 in £1 shares. Dirs.: T. A. Rathbone, Dovercourt, 287, Orrell Road, Orrell, Nr. Wigan; S. Rathbone and T. A. Rathbone, junr., The Woodlands, Lafford Lane, Upholland, Nr. Wigan, and J. Rathbone, Woodgarth, Orrell Mount, Orrell, Nr. Wigan.

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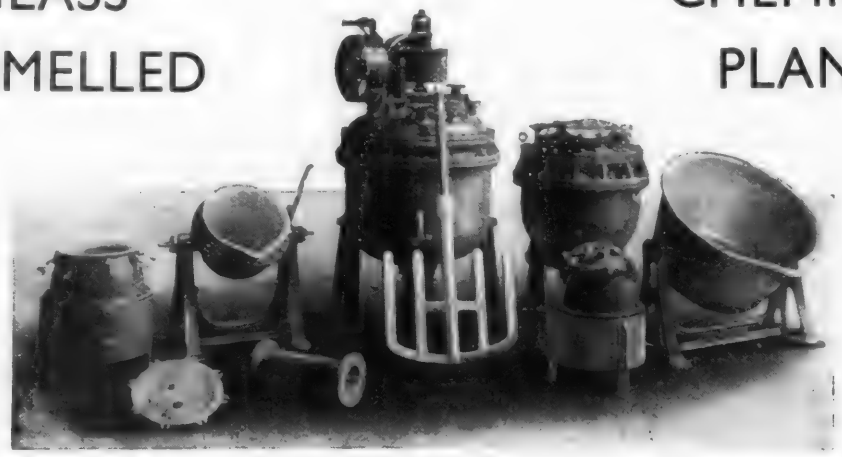

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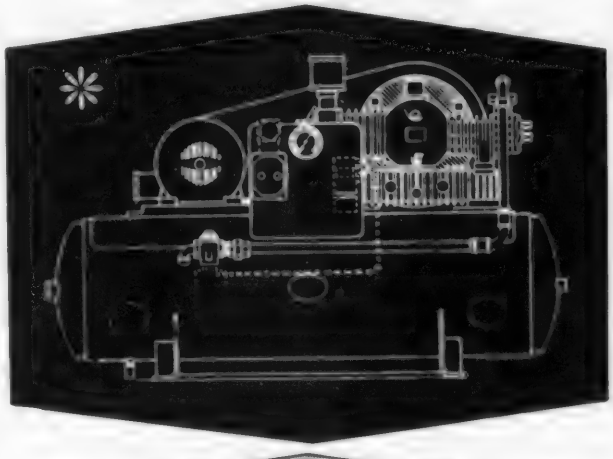

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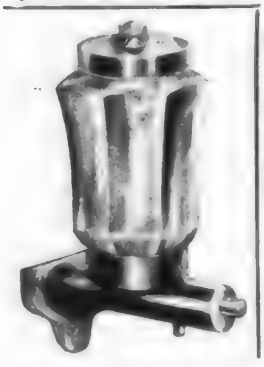

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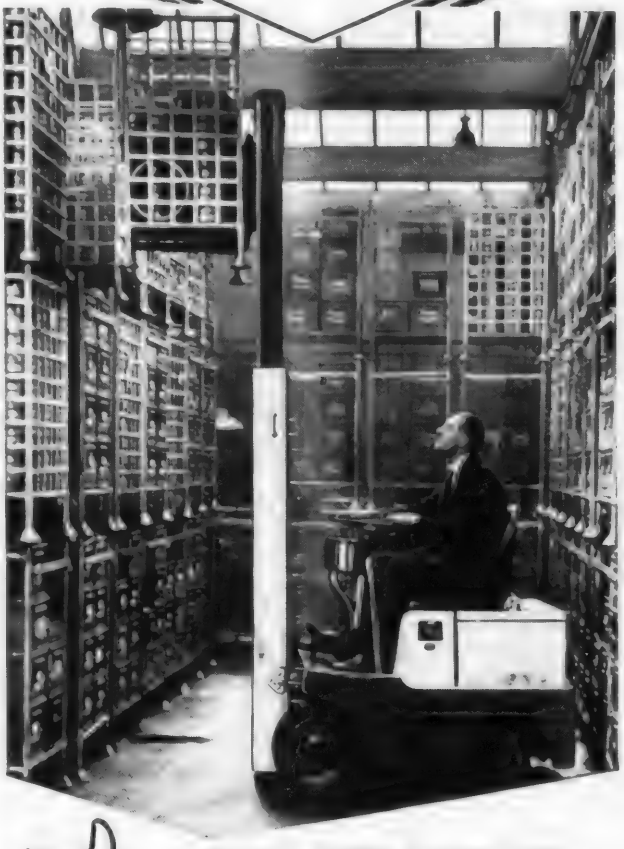

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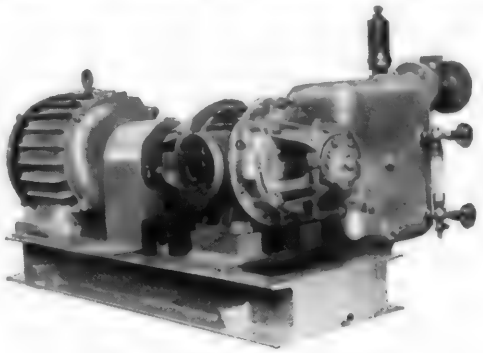

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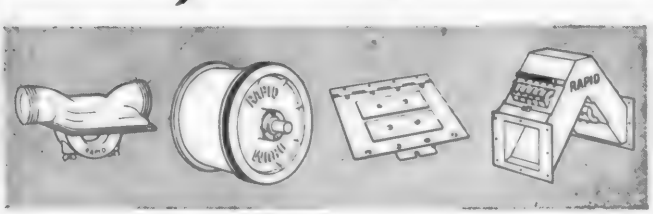

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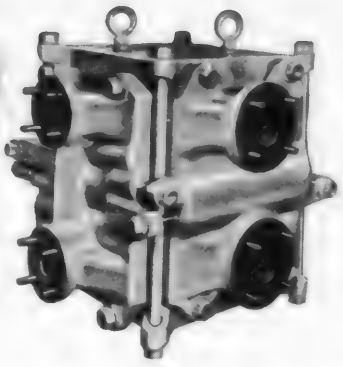

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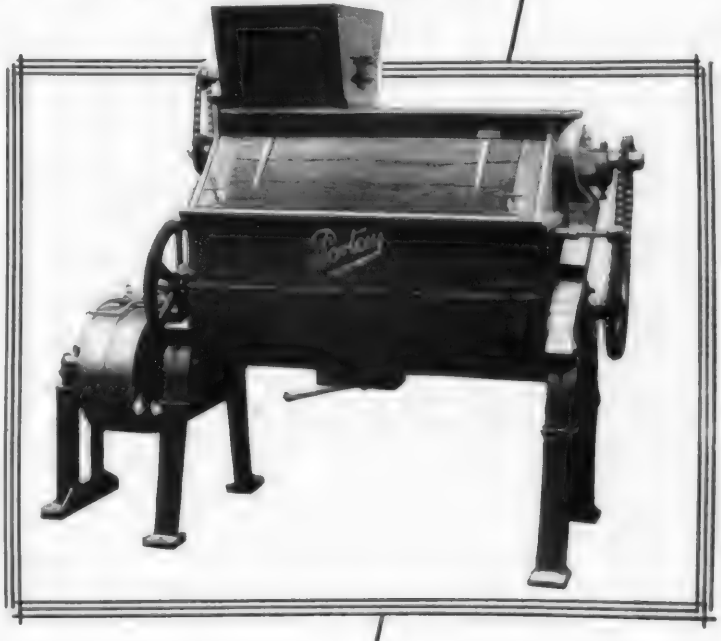

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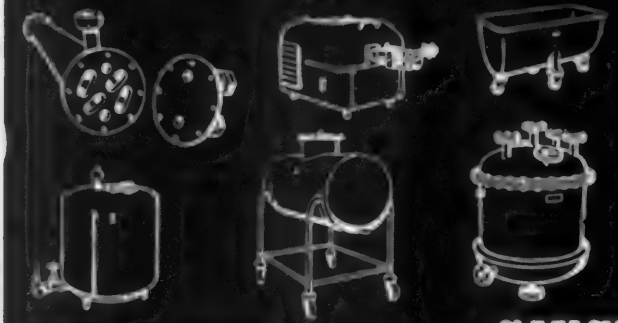

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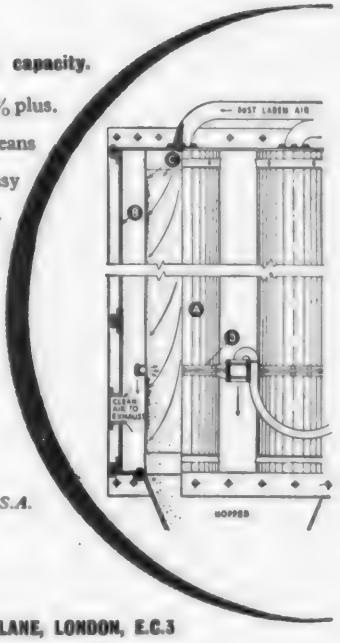

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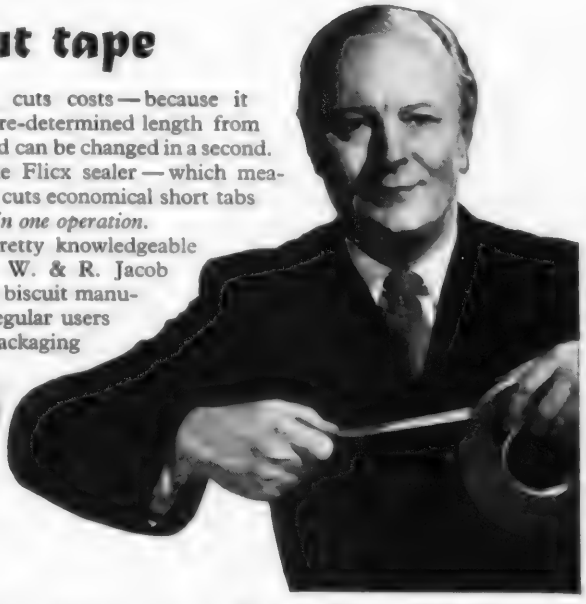

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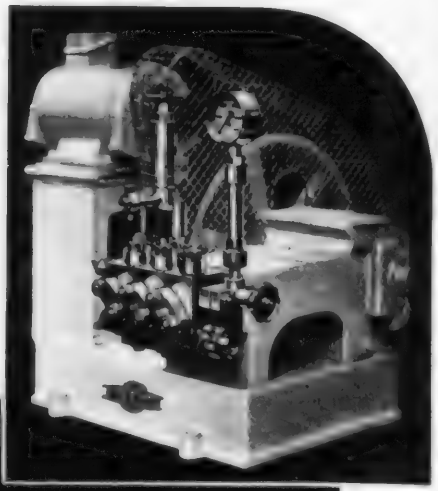

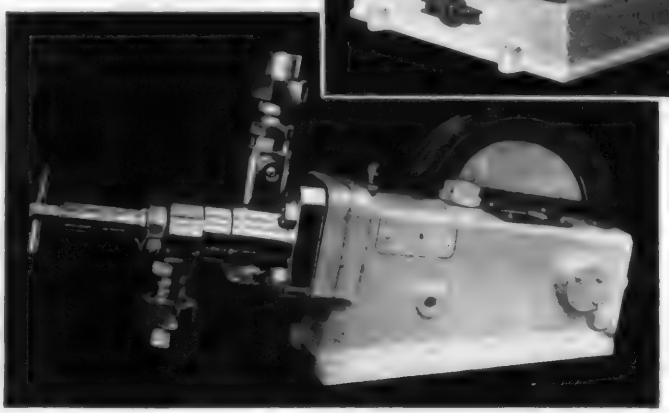

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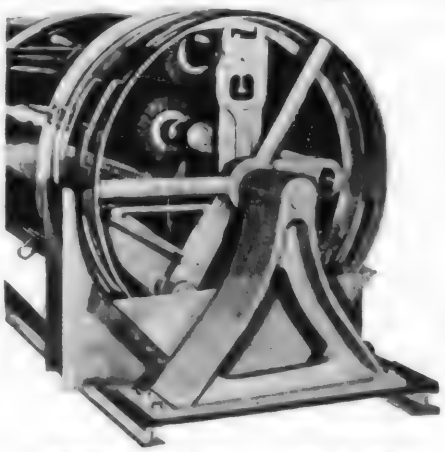

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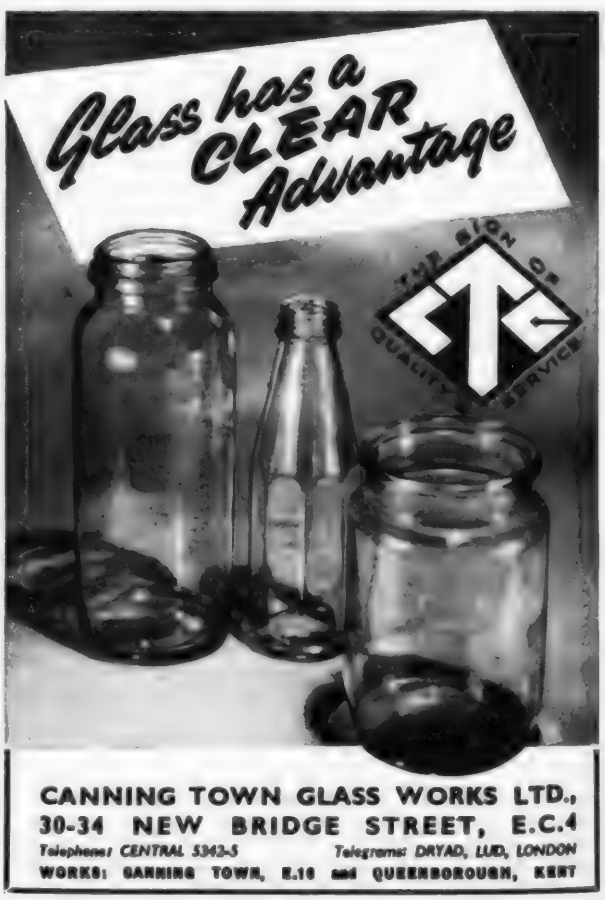

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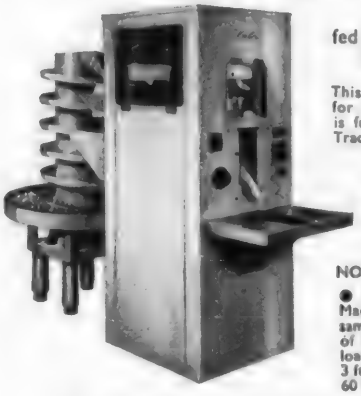

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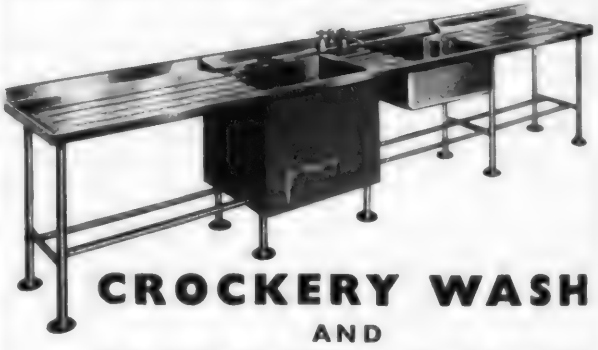

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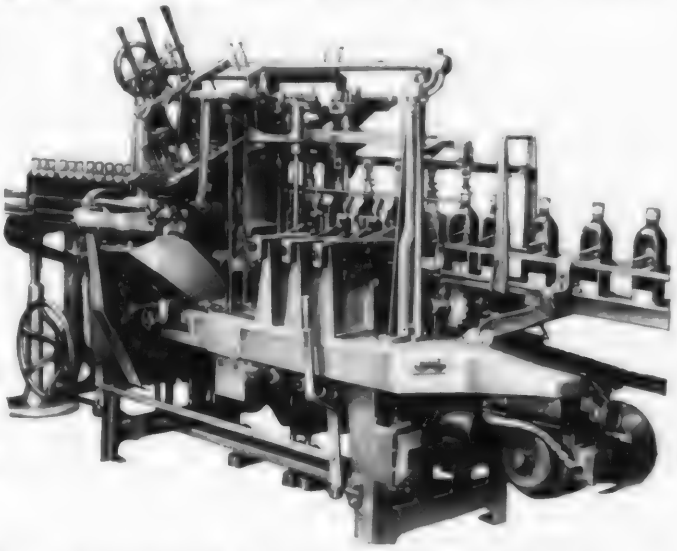

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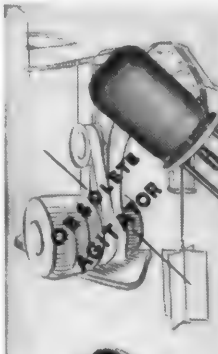

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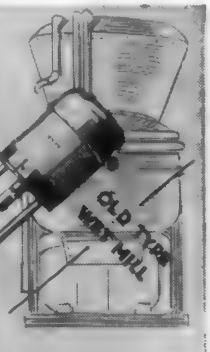

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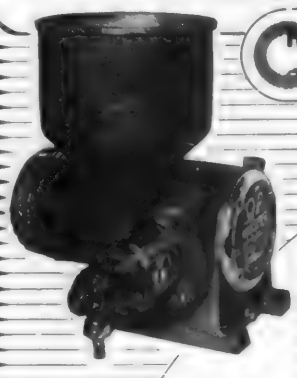

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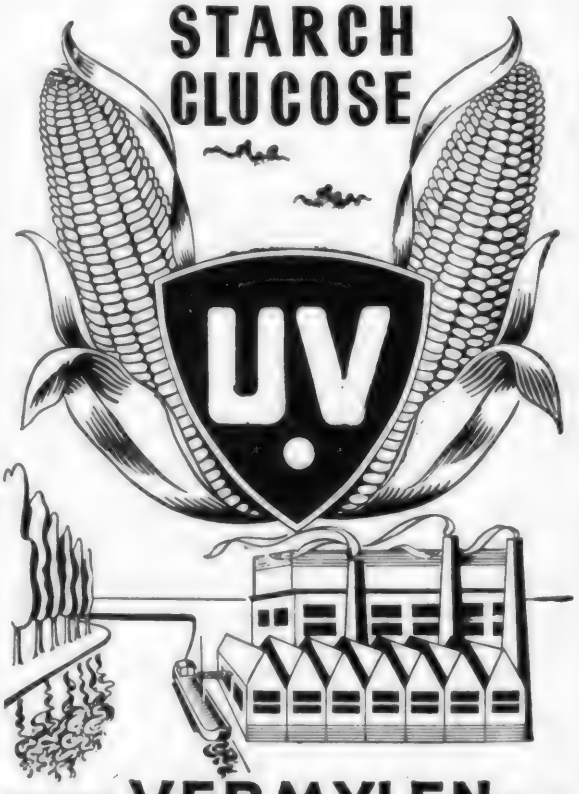

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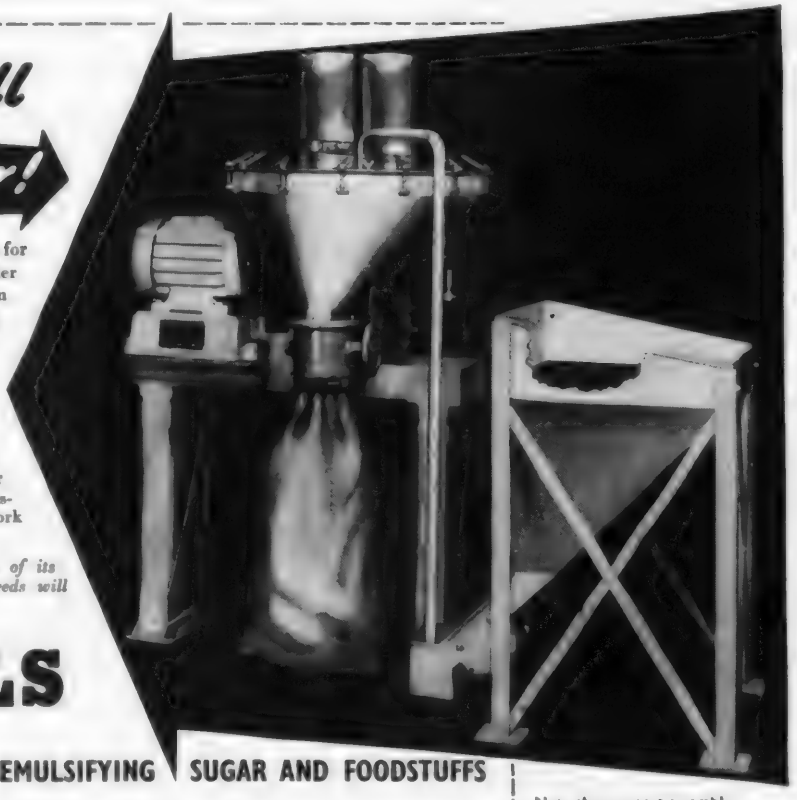

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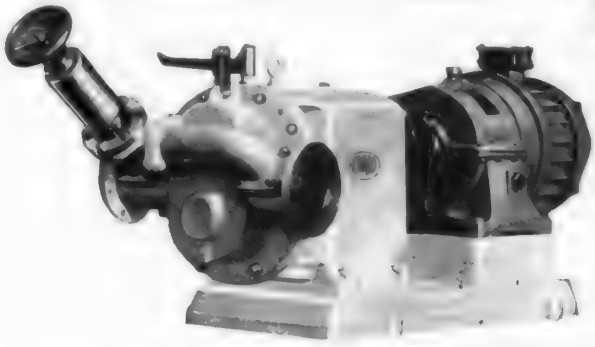

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The stainless steel portable container illustrated is supplied in sizes from 10-150 gallon capacity, and they are used for a variety of purposes in the food industry.

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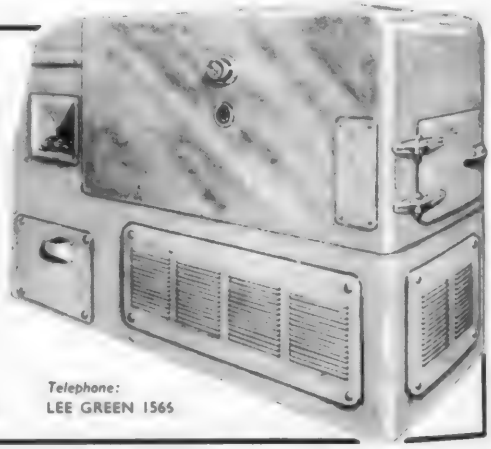

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COOKED Meats Expert with first-class experience in large-scale production of top quality open-pack products required for factory in Southern England. Excellent opportunity for right man to join progressive non-combine) firm of long standing and high repute. Please write fully in strict confidence. —Box B4724.

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GENERAL MANAGER FOR BACON FACTORY

1. Age: 30 to 45.
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4. Experience:
   (*a*) Experience of managing bacon factory of comparable size (say 100 pigs per week) including purchasing of pigs and marketing of bacon.
   (*b*) Experience of maintenance and operation of boiler and refrigeration equipment (inexperience of the particular plant purchased might be overcome by arranging for the Manager to attend a short course at the works of the manufacturers concerned).
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PRODUCTION Manager required by modern expanding South London food manufacturing company. Essential qualifications: initiative, drive and tact with high degree of experience handling labour. Knowledge of margarine production an advantage. Four-figure salary commensurate to experience. Superannuation scheme. Permanent position with excellent prospects for right man. Applicant should give full particulars of age, training, experience, situations held and salaries in chronological order.—Box B4728.

MANAGER with first-class experience of Margarine manufacture required for Scottish factory. Full details in strict confidence to Box B4729.

REQUIRED for new factory in process of erection in London. A first class animal by-products Manager with thorough technical knowledge. Excellent salary and commission. Details of past experience, etc., to Box B4739.

ASSISTANT Factory Manager required by an old established food manufacturing firm for factory in Gloucestershire. Previous experience of fruit and vegetable canning an advantage but not essential providing applicant has good knowledge of food processing and handling in general. Good prospects of promotion.—Box B4743.

EXPERIENCED Senior Chemist and Analyst required by the Co-operative Wholesale Society Limited, Technical Research Department, in Manchester. Applicant should possess an honours degree in Chemistry and preferably a F.R.I.C., Branch "E." The technician appointed would be required to assume the position of Deputy Head shortly after appointment and there is possibility of further advancement. Details of qualifications and experience, together with references to be addressed to: "Co-operative Wholesale Society Limited, Central Labour Department, 1, Balloon Street, Manchester, 4," marked "Senior Chemist, Technical Research Department, Manchester."

WANTED

by Dublin Food Firm

EXPERIENCED SAUCE MAKER

specializing in tomato ketchup, thick sauce and mayonnaise.

State full details.

BOX B4719

SITUATIONS VACANT

SALES Representative (Technical) fully conversant with the application of light alloys to the food manufacturing and transportation industries required immediately. Situation is pensionable and carries good remuneration. Car provided or car expenses in lieu of. Applicants must be resident in London or Home Counties.—Reply in full detail to Warwick Production Co. Ltd., Warwick.

SITUATIONS WANTED

FACTORY Manager, fully experienced fruit preserving, lemon curd, Christmas puddings, mincemeat, etc., wishes to change to more progressive firm. Over 20 years experience factory management and raw material buying. Keen, hard worker, in very good health. Age 48.—Box B 4727.

FRUIT Preserving and Canning Manager. Long experience at home and abroad, desires new position. Thoroughly competent in all branches in the manufacture of jams, marmalades, canned fruits, peels, cherries, pickles and sauces, mincemeat, table jellies, etc. Control of costings, stock, stores, laboratory, maintenance, labour, plant and machinery. —Box B4726.

MICROBIOLOGIST, experienced in routine control and experimental work in food industry, seeks similar post. Knowledge of industrial fermentation processes, etc.—Box B4733.

FOOD Technologist, with varied technical and managerial experience in canned and bottled foods, ice cream and dairy products, desires executive post.—Box B4734.

FOOD Technologist seeks position with small progressive firm. Able to improve existing lines, put new ones on the market. Energetic, staff control, costings, adaptable, salary secondary importance.—Box B4735.

FOOD Chemist, wide experience and outstanding success record in creation of new products, particularly prepacked grocery lines, desires position with enterprising manufacturers, interested also in export. Formulations of new, real "winner" products ready for marketing.—Box B4744.

SERVICES offered; 21 years varied experience of food production and plant, including control of labour, processes, installation and maintenance. Possessing organising and planning ability, knowledge of factory construction, services, materials, handling and packaging.—Box B4749.

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COSMETIC, Food, Drink and similar lines. If you have connection with manufacturers of the above and are interested in extending your range by additional lines, we, as makers of packaging machinery for all trades, will pay a good commission to agents or representatives and travellers for bona fide introductions leading to definite sales.—Write Box F.M. 913, c/o 191, Gresham House, E.C.2.

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CANNERY Stores and Plant. Beef Extract, Gelatine, Marmite, Beef Dripping, Egg Albumen, Onion Flakes, Mixed Spices, Cans, Cartons, etc. Equipment includes steam jacketed pans in copper, nickel and aluminium, retorts, mincing machine, can forming, seaming, flanging, testing and washing plant. —Write Box B4731.

ESTABLISHED manufacturers invite enquiries for genuine Worcestershire Sauce at 13/6 gall., ex-works.—Tamar Indien, Harders Road, Peckham, S.E. 15.

CHICKEN Leaf Fat, 2½ tons for sale. Highest quality, fine flavour. Delicate chicken odour. Packed in tins approx. 30 lb. What offers? —Box B4736.

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ALMONDS	DES. COCONUT
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REQUIRED redundant Wooden Boxes, Cases, Bottle Crates and Containers in large quantities.—Full particulars price etc., to Silverdale Box Supplies Ltd., Burgess Hill, Sussex. Tel.: 3485.

MEDICAL bottles; tablet bottles; jars; bottle closures, bakelite and metal purchased. Best prices paid.—Samples and full details in first instance to Noel Davold and Co., 9, Laurence Pountney Lane, Cannon Street, London, E.C.4. Tel.: MANsion House 3951-2.

SECOND-HAND PLANT FOR SALE

FOR Sale: Three Malangeurs, large cooling plates; three Duckworths, Fruit Cleaning Machine and other machinery suitable for the Food Trade.—Box B4750.

250 and 500 gall. cylindrical stainless steel Tanks with agitators; 100 gall. oblong s.s. Tanks; Alite and Johnston "Lightning" Filling Machines; Hunter "Emulsor" Emulsifiers and Homogenisers; Gardner Mixers, etc. Your enquiries invited.—Sorensen Bakery Equipment Ltd., 42, Raby Street, Moss Side, Manchester, 16. Tel.: MOSs Side 2054. 'Grams: Rahbek.

STEAM jacketed Steriliser or Vacuum, 3 ft. diam. by 7 ft. long, full swing door, jacketed, 30 lb. steam, full vacuum inside; ditto 4 ft. diam. by 8 ft. long; ditto 20 in. diam. by 3 ft. long, inside sizes. K.E.K. Grinding Mill, 18 in. diam. beaters, 15 h.p. motor, valves and fittings. "Johnson" wooden plate and frame Filter Press, 22 chambers, 39 in. by 22 in. by 2 in. thick, washing type. Stainless steel water jacketed Pasteurisers with mixing gear, 50- and 100-gall. Stainless steel Homogenisers by Brush, 150 gall. per hour and 75 gall. per hour, motorised, 440/3/50. Stainless steel Homogenisers by "Hurrell," 10 h.p. motor. "Premier" 5 in. Colloid Mill, 6 h.p. motor, 400/3/50. Stainless 50-gall. steam jacketed Tilting Pan. Stainless 60-gall. gas heated jacketed Boiling Pan. Stainless 60-gall. steam jacketed Boiling Pan. Three-speed Bowl Mixers, 4-, 8-, 30 and 60-quart. "Belhaven" Mixer Tilting Pan, 18 in. by 18 in. by 16 in. deep, double Z blades, 5 h.p. motor; ditto 29 in. by 28 in. by 22 in., gland packed bearings. Werner Mixer, jacketed pan, 29 in. by 29 in. by 28 in., double fin blades. "Gardner" Sifter Mixers, sizes D, F, E and G. Bowl choppers, Brandt capping machines, Peerless cutting machines, compressors and pumps.—Dartnall, 248, Humberstone Road, Plaistow, London, E.13.

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SECOND-HAND PLANT FOR SALE

"BENHILL" automatic Butter and Margarine Packing Machine complete with motor and starter. Excellent condition.—Sorensen's, 42, Raby Street, Manchester, 16.

BANKS B.L.M.2 Automatic Bottle Labelling Machine with variable speed A.C. motor drive. Capacity up to 650 dozen per hour with parts for 1 and 2 lb. jam jars. Perfect condition.—Apply Box B4746.

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FOR disposal. Rose Bros. E.P. Filling and Sealing Machine; Albro Vacuum Filler for powder; Jackson and Crockatt Minor Filling Machine; Southall and Smith Filling Machine; Belt roller Conveyor, 94 ft. by 28 in. belt; Gardner-type Sifter Mixers; Elevators and Conveyors; Silo 7 ft. 6 in. diam. by 3 ft. straight tapering 5 ft. to 9 in. outlet.—Monkhouse and Glasscock Ltd., London, S.E.1.

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WANTED Urgently, Gardner or similar type Powder Mixers, ½ to 1 ton capacity.—Box B4730.

SECOND-HAND PLANT FOR SALE

600

HORIZ. double trough stainless steel Butter Blender or Mixer by Baker Perkins, size 15½, trough 3 ft. 7in. by 3 ft. 3 in. by 2 ft. 6 in. deep. C.I. end plates stainless steel lined with stainless steel apron. Double "Z" stainless steel agitators driven through from Laurence Scott drip-proof slipring motor 20 h.p., 400/3/50. Hand tilting. Clip on stainless steel cover suspended over pan.

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Patent Continuous Rotary Cooler by A.P.V., motor driven.

Automatic Jam Filling Machine by Mather and Platt, with motor drive, capacity of machine approx. 16 cwt. per hour.

Stainless steel Fruit Pulper by Brierley, Collier and Hartley, motor-driven and complete with various spare sieves.

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267 kVA. Petter/Brush. Engine 5-cyl., 2-stroke, 500 r.p.m., air starting; Alternator 400/3/50, 4-wire.

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H.P.	*Make*	*Speed*	*Remarks*
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PREPACKED Grocery-lines. Formulation of sensational new "winner" products ready for marketing. Food Technologist with outstanding success record (lines created by advertiser well established Woolworth, Boots, Lyons, etc.), desires position with expanding manufacturers and packers.—Box B4745.

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WHOLESALE Food Distributors invite offers good selling lines.—Particulars to Box B4741.

THE proprietor of British Patent No. 651754, entitled Improvements in Apparatus for Cooking or Heating Syrups and like Fluids, offers same for license or otherwise to ensure its practical working in Great Britain.—Inquiries to Singer, Stern and Carlberg, Chrysler Building, New York 17, N.Y., U.S.A.

LEADING Food Importers, distributors and exporters with sales organization throughout the United Kingdom and most world markets with large turnover, seeking expansion, interested in contacting manufacturers or canners with reserve capital, at home or abroad, with a view to link up to mutual advantage. Principals only to accountants: J. H. Sisson Esq., Toy Campbell and Co., Ling House, Dominion Street, London, E.C.2.

WHOLESALERS having good connection in the South of England required to represent Manufacturers of Potato Crisps, Roasted Nuts, Nuts and Raisins, Biscuits and Cheese Spread, etc.—For terms apply Box B4714.

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SECOND-HAND PLANT FOR SALE

GARDNER Combined Sifting and Mixing Machines: two size G, each with A.C. motor; one Gardner Rapid Mixer only, stainless steel lined, trough 40 in. by 15 in. by 15 in. deep; Gardner Experimental Mixer, size A; Gardner jacketed Dryer, size D, nearly new, trough 40 in. by 15 in. by 18 in. deep.—Frank Stacey and Co. Ltd., Vauxhall Street, Birmingham, 4.

PULVERISING, Grinding, Mixing, Drying. We collect and deliver.—Crack Pulverising Mills Ltd., Plantation House, Mincing Lane, London, E.C.3. Mansion House 4406.

AGENTS and Wholesalers wanted to increase the sale of really first-class sugar flowers and novelties to the Bakery and Retail Trades. Generous commission and trade discount allowed.—Write in first instance giving age, experience, type of trade and area covered, also references to Box B4722.

DAMAGED or redundant stocks of food, residues or by-products in large or small quantities required.—Send your offers to Rotunda Foods Co., London Office: 50/52, Blandford Street, W.1. Tel.: Welbeck 8465.

FULL Steam in five minutes with B. and A. Electrode Boilers, used by British industries for twenty years. No boilerhouse, no flue, no attendant needed. The most compact and convenient steam raisers available, can go beside machines using the steam.—Write for leaflet 125, Bastian and Allen Ltd., Ferndale Terrace, Harrow, Middlesex.

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Area 25,000 sq. ft. on 3 floors
situate 20 miles North of London
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Rent 2/6d. per square foot per annum.

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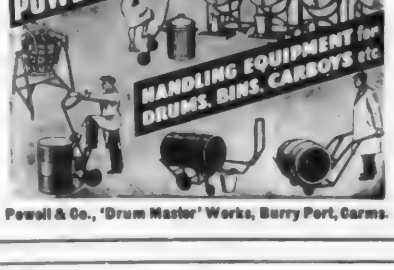
JAMS, Marmalade, Lemon Curd and Fruit Squash Business. Clean and well-equipped factory. Three boiling pans, mincer, mixer, labellers, syrup mixing pan, squash agitator, electrode steam boiler, etc. Three lorries and one 10 cwt. van. Office accommodation adjoining premises. Ground floor area of factory 2,270 sq. ft., 1st floor 1,760 sq. ft. Freehold property.—Box B4751.



Powell & Co., 'Drum Master' Works, Barry Port, Carms.

PLANT FOR SALE

"SILVERSON" combined Mixer-Emulsifier, model BX 3-35 gall. capacity, condition as new. 220/240 volts A.C. Value new £113. Accept first offer £70. Seen London.—Box B4737.

FOR Sale: three Coventry Climax petrol driven Fork Lifting Trucks, two with 14 ft. masts, the other with 10 ft. mast, complete with a number of spare parts and a spare engine. In running order. Any reasonable offer considered.—Box B4742.

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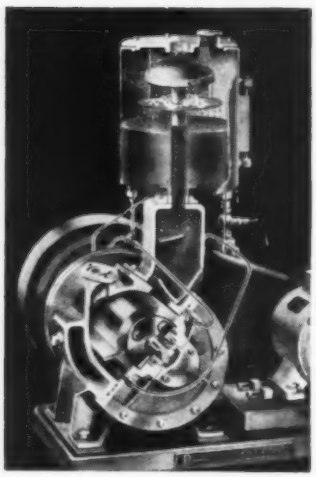

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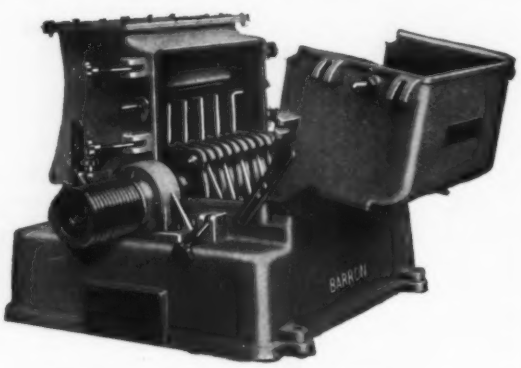

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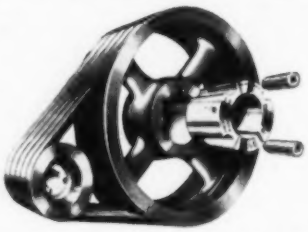

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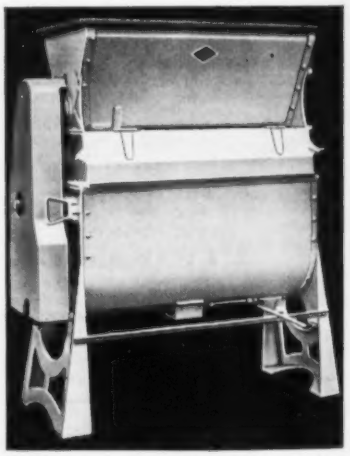

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